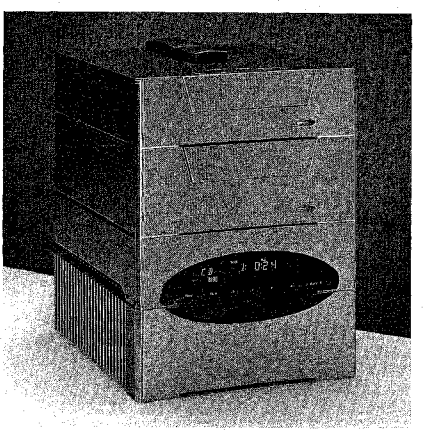
The Harman Kardon
FESTIVAL 300 / 500

Intelligent music systems

Technical Manual



harman / kardon

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THE FOLLOWING MARKS FOUND IN THE PARTS LIST OF THIS MANUAL IDENTIFY THIS MODEL AS FOLLOWS :

USA : NORTH AMERICA MODEL
UB,BB : INTERNATIONAL MODEL
JPN : JAPAN AREA MODEL.

SPECIFICATION

Festival 300/500

CDP :

System	Compact Disc Digital Audio
D/A Convert	Dual, linear, Pulse Width Modulated Bit Stream, Clock Rate: 33.8688 MHz
Signal Detection	3-Beam Semicondctor Optical Laser Pickup
Error Correction	CIRC System
Low Level Linearity	± 1.0 dB @-90 dB
Frequency Response	4 Hz - 20 kHz 0dB/-1.5dB
Total Harmonic Distortion	0.007%
Dynamic Range	97 dB
Singnal to Noise Ratio	101 dB
Channel Separation	88 dB
Line Output Level/Impedance	1.6-2.0V @10 kohm
Dimension (m/m) (H × W × D)	80 × 270 × 335
(in.)	3 1/8 × 10 5/8 × 13 1/4
Weight (Kg)	3.2
(lb)	7.1
Laser wave length	760~780nW
Laser output power	0.4Watt

Tape Deck :

Type	Horizontal 4-track, 2 channel Auto reverse
Heads	1 hard permalloy Rec/Play Head 1 double gap Erase Head
Tape Speed	4.76 cm/sec 1 7/8 IPS
Frequency Response @-20dB	20 Hz - 19 kHz ±3dB (Metal Tape)
Wow and Flutter NAB, WRMS/DIN	0.05%/0.08%
Signal to Noise Ratio.	
w/CRO2, A-WTD Dolby off	57 dB
Dolby B on	65 dB
Dolby C on	73 dB
Total Harmonic Distortion	1.0%
(1 Khz, metal tape, Dolby level)	
Channel separation	45 dB
Channel Crosstalk	70 dB
Erase ratio	60 dB
Bias Frequency	105 kHz
Output level, Dolby level	365 mV
Input level Dolby level	365 mV
Dimension (m/m) (H × W × D)	100 × 270 × 335
(in.)	4 × 10 5/8 × 13 1/4
Weight (Kg)	3.8
(lb)	8.4

REMOTE CONTROL :

Dimension (mm/in)	19 × 43 × 168 3/4 × 1 5/8 × 6 5/8
Weight (kg/lb)	0.14/0.31

FM Tuner Section:	76-90 MHz	JPN
Tuning Range	87.5 - 108.0 MHz	USA, I.IB.BB
Usable Sensitivity Mono	13.2 dBf	
50dB Quieting Sens, Stereo	47.2dB	I.IB.BB
	40dBf	USA, JPN
Signal to Noise Ratio @ 65 dBf	70dB/65dB	I.IB.BB
Mono/Stereo	78dB/70dB	USA, JPN
Capture Ratio	1.5 dB	I.IB.BB
Selectivity,		
Adjacent/Alternate Channel	10 dB/75 dB	
IF rejection	90 dB	
Stereo Separation @ 1kHz 65dBf	50 dB	USA, JPN
	47 dB	I.IB.BB
THD @ 1 kHz, 65dBf Mono/Stereo	0.15/0.20%	
Output Level	400mV	

AM Tuner Section:	520-1710 kHz	USA
Tuning range	522 - 1629 kHz	I.IB.BB, JPN
Sensitivity	400 μV /m	≤ 700 μV /m
Selectivity	30 dB	≥ 18 dB
Image rejection	40 dB	≥ 30dB
IF rejection	65 dB	≥ 55 dB
Dimension (mm/in.)	80 × 270 × 335	3 1/8 10 5/8 13 1/4
Weight (kg/lb)	4.0/8.8	
Output Level	120mV	

Amplifier	**A500**	**A300**
Continuous Average Power 4 Ohm 20Hz-20kHz 0.3% THD	60 Watt	35 Watt
High Instantaneous Current Capability	± 35 Amps	± 25 Amps
Negative Feedback	20 dB	20 dB
Power Bandwidth @ Half Rated Power (into 4 Ohms)	10Hz-100 kHz	10Hz-100 kHz
Frequency Response @ 1W+0/-3dB	0.5Hz-180 kHz	0.5Hz-180 kHz
Input Sensitivity	150mV	150mV
Slew Rate	140V/μ sec	100V/μ sec
Rise Time	1.8μ sec	1.8μ sec
Damping Factor	60	60
Signal to Noise Ratio (below rated, power, A-wtd)	98 dB	98dB
Tone Control Range (+/-) (Bass @ 50Hz/Treble @ 10 kHz)	10/10 dB	10/10dB
Bass assist Boost @ 55 Hz	6 dB	6dB
Dimension (m/m) (H × W × D)	100 × 270 × 335	100 × 270 × 335
(in.)	1/4 × 10 5/8 × 13	1/4 × 10 5/8 × 13 1/4
Weight (kg)	6.6	5.5
(lb)	14.5	12.1

Specifications and components are subject to change without notice.
Overall Performance will be maintained or improved.

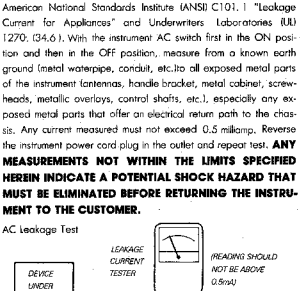
SAFETY PRECAUTIONS

Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

a. Be sure that no built-in protective devices are defective and /or have been defeated during servicing.
   (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
   (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks.
   Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

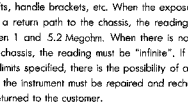
b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, both are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back over.

c. **Leakage Current Hot Check**–With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101. 1 "Leakage Current for Appliances" and Underwriters Laboratories (UL) 1270; (34.6). With the instrument AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.)to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test. **ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.**


AC Leakage Test
LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5mA)
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

d. **Insulation Resistance Test**
   (1) Unplug the power supply cord and connect a jumper between the two prongs of the plug.
   (2) Turn on the power switch of the instrument.
   (3) Measure the resistance with an ohmmeter between the jumpered AC Plug and each **exposed metallic** cabinet part on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. The reading should be as shown below. If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.

e. **Insulation Resistance Test Cold Check**
   (1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug.
   (2) Turn on the power switch of instrument.
   (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each **exposed metallic** cabinet part on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 Megohm. When there is no return path to the chassis, the reading must be "infinite". If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.



PRODUCT SAFETY NOTICE

Some electrical and mechanical parts have special safety related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. parts that have special safety characteristics are identified by shading, by ⚠ and/or schematics and parts listed. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. Products Safety is under review continuously and new instructions are issued whenever appropriate.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this manual and its supplements, read and follow the SAFETY PRECAUTIONS on this page.

NOTE:If unforeseen circumstances crated conflict between the following servicing precautions and any of the safety precautions, **always follow the safety precautions.**

Remember:Safety First.

General Servicing Precautions

a. Always unplug the instrument AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
   (2) Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
   (3) Connection a test substitue in parallel with an electrolytic capacitor in the instrument.
   Caution:A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

b. Do **not** defeat any plug/socket B+ voltage interlocks with which instruments covered by this manual might be equipped.

c. Do **not** apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

NOTE: Refer to Safety Precautions on page 3.

(1) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(2) The Components used in the unit has a specified conflammability and dielectric strength. When replacing any components, use components which has the same ratings. Components marked !Δ!in the circuit diagram are important for safety or for the characteristics of the unit. Always replace whit the appointed components.

(3) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.

(4) After servicing, always check that the removed screws, components and wiring have been installed correctly and that the portion around the serv ce part have not been damaged and so on. Further check the insulation between the blades of attachment plug and accessible conductive parts.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect the insulation resistance meter !500V! to the blades of the attachment plug. The insulation resistance between the each blade of the attachment plug and accessible conductive Parts !Note 1 !should be more than 1M-ohm.

Note 1: Accessible Conductive parts including Metal Panels, Output jacks, etc.

ELECTRO STATICALLY SENSITIVE(ES) DEVICES

Some semiconductor !solid state!devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field!effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

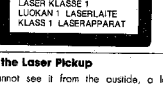
1. Immediately before handling any semiconductor compornent or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static"can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION:Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. !Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

CLASS 1 LASER PRODUCT

Product complies with DHHS rules CFR subchapter J part 1040.10 at date of manufacture.

DANGER—invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to the beam.

CAUTION—use of all controls, adjustments or performance of procedures other than those specified herein may result in hazaudous radiation exposue.



Be Carefui of the Laser Pickup

Although you cannot see it from the ousitide, a laser pickup is located under the disc tray and a precision lens is built in it.

Since the laser pickup, including the lens element, is especially sensitive to dust, keep the disc tray closed when not in use.
Also do not put your hand inside the unit.

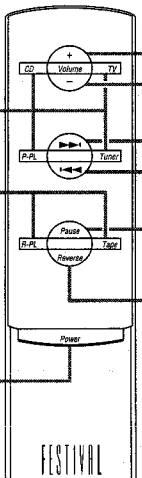
ADVARSEL:
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

VAROITUSI
Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä.

COMPONENTS AND THEIR FUNCTIONS

OPERATING THE REMOTE

Press one of these to change the source of the music:
- CD for disc
- P-PL (program play) for favorite songs from disc
- R-PL (random play) for songs from disc in random order
- TV (optional) for auxiliary components
- TUNER for radio
- TAPE for cassette



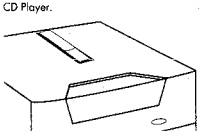
Press VOLUME + and – to adjust sound level up or down.

Press directional buttons ►►I and I◄◄ to tune stations or move one track at a time through a disc or tape. (Press and hold ►►I and I◄◄ for two seconds to go up or down to the next radio station preset.)

Press PAUSE to mute sound. Press VOLUME + or PAUSE again to resume listening.

Press REVERSE to play the opposite side of a tape.

NOTE: When not in use the remote may be placed in the cradle on top of the CD Player.



Press POWER to turn system on and off.

FRONT PANEL CONTROLS AND ELECTRONIC LABELS

CD and Tape Drawers
The button to the right of the drawer on the CD and tape players can be pushed to open and close the drawer when inserting discs and tapes.

Except for the open/close buttons, all front panel controls are located on the tuner-controller within a large oval window.

All system functions are accessed through pushbuttons located across the middle of this window. Additional set-and-forget controls are located behind a pull-down gate located immediately below the row of pushbuttons.

NOTE: The speaker switch(es) behind door must be pushed in to hear music.

The "EXTERNAL" indicator reminds you to check your external components, if any, anytime the auxiliary input/output jacks are in circuit. If "EXTERNAL" is lighted, but there is no sound, make sure your external device(s) are on.

Here is the large four letter operating mode display, which shows at a glance which source is playing or if you're in CD favorite track programming mode (CDPR) (CD program).

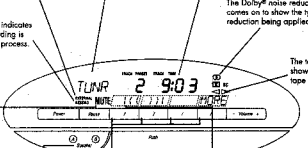
The main numeric display shows the CD track or radio station you're listening to, or the tape counter time.

The Dolby® noise reduction indicator comes on to show the type of noise reduction being applied to the tape.

"RECORD" indicates that a recording is currently in process.

The tape direction indicators show the actual direction of tape movement.

"MUTE" is displayed anytime the PAUSE control is engaged.



Note: The speaker switch(es) behind door must be pushed in to hear music.

The functions of these four buttons are identified by these four ELECTRONIC LABELS directly above them, allowing the functions to change. To activate Electronic Labels, simply press any of these four buttons. Then proceed by pressing the button directly below the feature label you wish to use. If at any time you to wish start over, simply wait 10 sec. and start again.

Operating Modes

Festival systems simplify operation by grouping all commands into three basic modes.

We call source selection the "listen mode"—**LSTN** for short. Programming is **PROG.** (program). And recording is **RCRD.** (record). The three of them together comprise your main menu of choices, and all functions are accessed through one or the other of the three operating modes. All functions are operated in essentially the same way, that is, by pressing the unmarked button immediately below the label designating the function on the display.

The Main Menu

Everything starts with the main menu, and you can get to the main menu one of two ways.

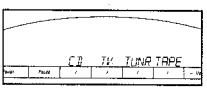
Press POWER on the far left of the row of buttons to turn Festival on. The display will light up, and the system will activate the source in use when the system was turned off. (When turned on for the first time, Festival will choose TUNR for the radio.)

If the power is already on, press any one of the four unmarked buttons in the middle of the row.

In either case, the main menu will appear on the display.

LISTENING

The LSTN mode lets you select the tuner, the CD player, or the cassette deck, as well as one auxiliary source. When you press LSTN the display reads:

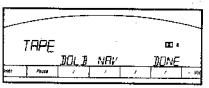


TV refers to an auxiliary source. The other labels refer to the Festival components.

Select a source by pressing the button immediately below the electronic label. Note that when you select any source other than TV you automatically access the functions for that source and that source begins to play.

TAPE LSTN (Listen) Functions

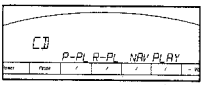
When you select TAPE, the display presents you with two functions:



DOLB stands for Dolby® noise reduction which is selectable through the DOLB button. Press repeatedly to choose Dolby B type noise reduction, Dolby C, or no noise reduction. When Dolby noise reduction is engaged **DD** will be shown in the display along with the letter designation B or C.

CD LSTN Functions

When you select CD, the CD begins to play and the following choices appear on the display:

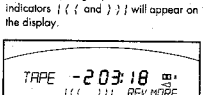


Note that if the CD player is empty, the drawer will slide out, prompting you to load a disc and push the drawer closed.

P-PL (program play) indicates programmed play. In order to exercise this function, you must first program your favorite selections for the current disc. Refer to the section on programming for programming directions.

R-PL (random play) indicates random play. Press R-PL and the CD player will automatically select a random order for playing back the tracks on the CD in the loading tray.

Press NAV (navigate) and the directional indicators { { { and } } } will appear on the display.

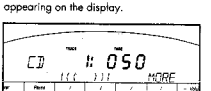


{ { { will automatically rewind the tape back to a previous song and } } } will advance it to a subsequent song. The number of songs to be skipped forward or back are indicated to the left of the tape counter in the display.

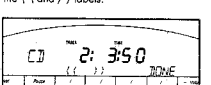
REV — As on the remote, pressing REV reverses the tape. It can also be used to cancel fast forward or rewind. (See below.)

PLAY—Press PLAY to switch from P-PL or R-PL to normal CD play, beginning with the current track.

NAV (navigate)—Press NAV and you can move from track to track using the buttons under the { { { and } } } labels appearing on the display.

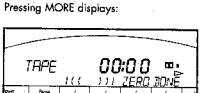


MORE — Press MORE and you can search up or down through the disc to any passage using the buttons beneath the { {and } } labels.



DONE always returns you to the main menu.

Pressing MORE displays:



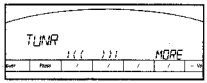
Rewind and Fast Forward — Press { { to rewind to the beginning of the current side and } } to fast forward to the beginning of the next side.

ZERO — Press ZERO to reset the tape counter.

Important Note: The controls on this page will function when the tape is paused by the PAUSE button. This feature can be used to set up for a manual recording. (See Appendix D).

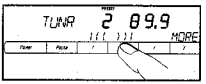
LISTENING

TUNR LSTN Functions
To play the tuner, first select LSTN and then select TUNR from the LSTN choices. The display will now read:



Pressing either directional key will put you into the SEEK mode, and the tuner will proceed to the first strong station.

Press and hold either directional key for two seconds to call up or change the PRESET number (1 to 19) in the display. Continue to hold the directional key to cycle through your presets.

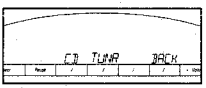


AM and FM Tuning
Press MORE to activate the manual tuning function. Use the directional keys to tune up and down the bands. Note that the Festival systems do not have a manual AM/FM switch. To get from one band to another hold either directional key and run through the band you're currently occupying. You'll automatically pass into the other band. (Note that if you use FM only, push the switch on the tuner back panel to bypass the AM band when tuning.) Save your favorite stations in the presets in the PROGRAMMING MODE.

PROGRAMMING

Programming the CD player
Load the CD in the compact disc player. Enter the main menu. Select PROG (program).

The display will prompt you to choose a source to program. Note that BACK always returns you to the previous display screen.



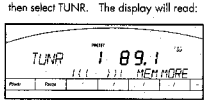
The Festival compact disc player and tuner are programmable. Programming the tuner consists of saving station presets, while CD programming lets you choose your favorite tracks from a given CD for playback by the P-PL command.

Press CD to program the CD player. The display now reads:

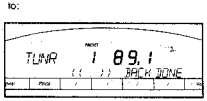
Use the directional keys to select the tracks you wish to program, and with each track selection press MEM to enter the selection into memory. Then to begin programmed play press P-PL. The CD player will then play only those tracks programmed into memory.
NOTE: The program for a given CD is erased when you open the tray.

PROGRAMMING

Programming Tuner Presets
To program Tuner presets first enter the main menu by selecting any of the unmarked buttons. Next press PROG and then select TUNR. The display will read:

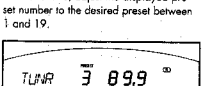


Pressing MORE will change the display to:



Use MORE and BACK to change between these two screens while in the tuner presetting mode.

Using } } { and { { to SEEK or ((and)) to tune manually (See TUNR LSTN functions, above.), tune to a station you wish to memorize. Then, by pressing } } { or { { (for more than two seconds at a time, adjust the displayed preset number to the desired preset between 1 and 19.



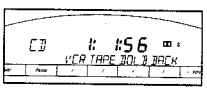
Press MEM (memory) to save that station in that preset number. The preset will automatically be increased by 1 when you press MEM, so you needn't adjust the number manually when memorizing many stations at once.

NOTE: After a period of 10 seconds, Festival will revert to the main menu.

RECORDING

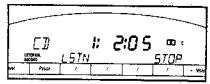
The Festival system gives you considerable flexibility in making recordings. You can record within the system from the tuner or CD player onto the cassette deck. You can also record from a system source to an outboard recorder. You can also record from an outside source onto the system cassette deck. However, when outboard components are involved the process is less automatic.

Before making a recording, you must first select the source you wish to record by entering the LSTN (listen) mode from the main menu, and, of course, you must load a blank cassette in the tape well. Then go back to the main menu and press RCRD (record). The display will read:



Note that TAPE and DOLB will not be lit if you are listening to TAPE. This prevents inadvertently recording over a favorite tape.

Recording to an external recorder
VCR should be selected when recording to an external recorder you've connected to your system. If you're using the system cassette deck to record, you can disregard this section. When you press VCR, EXTERNAL and RECORD will appear in the display to remind you to set up your external component for recording. Also, the STOP command is added to the main menu, so you can stop recording. Finally, PROGRAMMING and RECORDING commands are omitted from the main menu



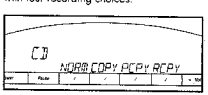
while recording is in progress.
IF YOU HEAR NO SOUND AFTER PRESSING VCR, CHECK THE CONNECTIONS AND SETTINGS OF THE EXTERNAL RECORDER.

Dolby noise reduction is selectable through the DOLB button. Press DOLB once to choose Dolby B type noise reduction, again for Dolby C, and again for no noise reduction. When noise reduction is engaged the DX will be shown on the display along with the letter designation B or C.

BACK takes you back to the main menu.

RECORDING

Recording to the internal cassette
Press TAPE and the display presents you with four recording choices:



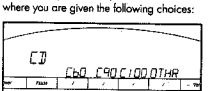
When you select NORM (normal) the cassette deck will begin recording the source immediately.

Select COPY to automatically duplicate a CD onto tape. The tape is wound back to the beginning, and the recording starts at the beginning of track one.
THE COPYING PROCESS CAN ONLY BE INTERRUPTED BY PRESSING THE BUTTON BELOW **STOP** ON THE DISPLAY OR SHUTTING OFF THE POWER.

PCPY (programmed copy) stands for Programmed Copy. It is like COPY, but only the pre-programmed selections are copied. The CD player must have been previously programmed for the current disc.

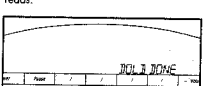
RCPY (random copy) stands for random copy, and it is the same as COPY, except the disc is copied to tape with the songs in random order.

Choosing COPY, PCPY, or RCPY automatically places you in the optional EDIT mode where you are given the following choices:



C60, C90, and C100 refer to 60, 90, and 100 minute tapes respectively.

Festival uses this information during the copying process to record the songs to avoid running out of tape in mid track. If desired, press the button corresponding to the tape you're using, to activate the EDIT feature for this recording. After you have selected a tape length, the display reads:



Pressing DOLB repeatedly cycles you through the choices of Dolby B noise reduction, Dolby C noise reduction, or Dolby noise reduction off. DONE completes the command sequence.

OTHER FRONT PANEL CONTROLS

A hinged door directly below the row of seven pushbuttons conceals secondary controls. Press the top of the gate to lower it and expose the controls.

The SPEAKER button(s) (A and B on the Festival 500) let you turn each pair of speakers off, to listen through headphones or to one speaker pair at a time.

BALANCE adjusts the relative levels of the left and right channels.

TREBLE and BASS are tone controls.

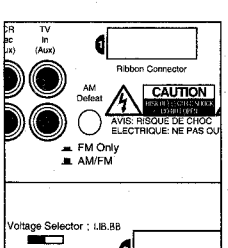
BASS ASSIST should only be used with Festival speakers. It extends low bass response when the button is in.

PHONES is a jack for lightweight stereo headphones. (Use the SPEAKERS button(s) to turn the main speakers off.)

REAR PANEL CONTROLS

AM DEFEAT

This control is located on the tuner back panel. When this button is pressed in, only FM stations may be tuned, although AM presets that were previously memorized may still be called up in the usual way.



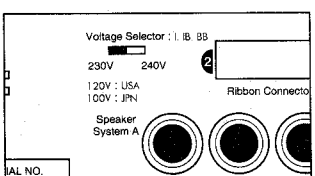
120V : USA
100V : JPN

APPENDIX A

CONNECTING ADDITIONAL COMPONENTS TO YOUR FESTIVAL SYSTEM

The TV (Aux) input at the extreme right of the row of phono jacks on the tuner-controller will accept almost any stereo output except for that of a turntable. You can, for instance, connect the audio outputs of a stereo television, a stereo VCR, a laserdisc player, DCC, Mini-Disc, or a satellite receiver. The VCR Rec (Aux) output, which is next to the TV (Aux) input, lets you record from any of the sources comprising the Festival system onto another cassette deck, a hi-fi VCR deck, a Mini-Disc player, or a DCC deck. Keep in mind, however, that if you utilize the VCR Rec (Aux) output, you must initiate the recording from the outboard component. The Festival's system commands cannot control the recording process for any recording device aside from its own cassette deck.

AC VOLTAGE SELECTOR : I.IB.BB
Export models of the Festival systems have switches permitting the selection of either 230V or 240V AC voltages. This control is located on the integrated amplifier back panel.



CD OUTPUT LEVEL CONTROL

The CD output level is preset at the factory for optimum recording and listening performance. Some advanced users may want to customize this setting. This level control on the CD back panel has three settings: 0 dB—the standard setting, + 1.5 dB, and + 3 dB.

ELECTRICAL PARTS LIST REFERENCE

NOTE : Assignment of common parts codes.

RESISTOR

1-116-[1][1][1] - 2[2] Carbon film resistor, ± 5%, 1/8W
1-114-[1][1][1] - 2[2] Carbon film resistor, ± 5%, 1/4W
(2) lead type
(1) resistor value

Examples

(1) Resistor Value
0.47 ohm···478 4.7 ohm···479 68 ohm···680
470 ohm ···471 2.7 Kohm···272 56 Kohm···563
(2) Lead type
PS type ···1 TP type ···5

CERAMIC CAPACITOR

1-886-[1][1][1] - [2] 5 Ceramic capacitor
disc type
Temp. coeff. P350-N1000, 50V
(2) tolerance (capacity deviation)
(1) capacity value

Examples

(1) Capacity Value
4pF ···040 47pF ···470 220pF ···221
(2) Tolerance
±0.25pF·····0 ±0.5pF ·····1 ±1pF·····2
±2pF ·····3 ±5pF ·····4 ±10pF·····5
±20% ·····6 +50%-20%···7 +40%-20%···8
+80%-20%·····9

MYLAR CAPACITOR

1-506-[1][1][1] - 41 Mylar capacitor, ±5%, 50V
(1) capacity value

Examples

(1) Capacity Value
0.00047uF·····471 0.0056uF·····562 0.047uF·····473
0.68uF ·····684

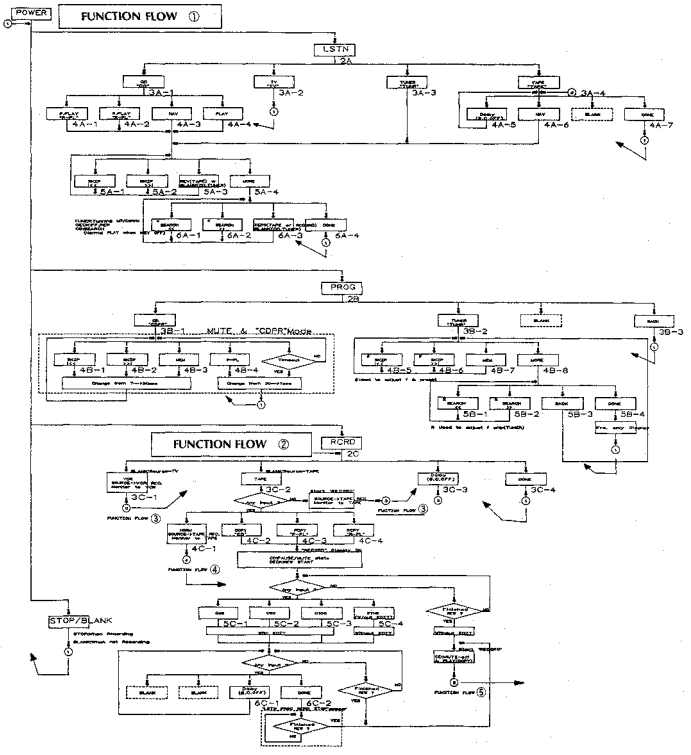
ELECTROLYTIC CAPACITOR

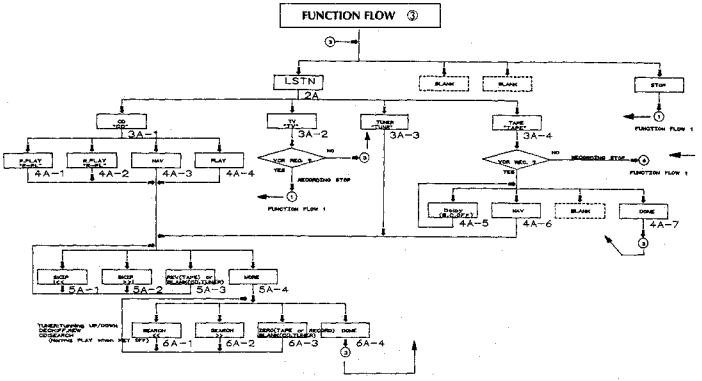
1-42[1] - [2][2][2] - 6[3] Electrolytic capacitor, ±5%, 50V
(3) lead type
(2) capacity voltage
(1) working voltage

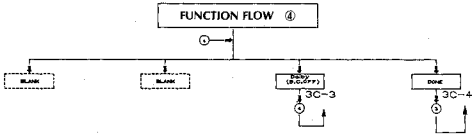
Examples

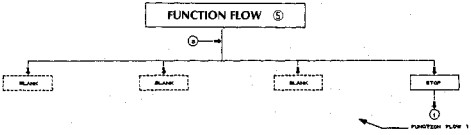
(1) Working Voltage
6.3V·····1 10V·····2 15V·····3
25V·····4 35V·····5 50V·····6
(2) Capacity Value
0.47uF·····478 4.7uF·····479 33uF·····330
470uF·····471 2200uF·····222
(1) Lead type
A-type·····1 A-type TP·····2

SYSTEM FLOW CHART



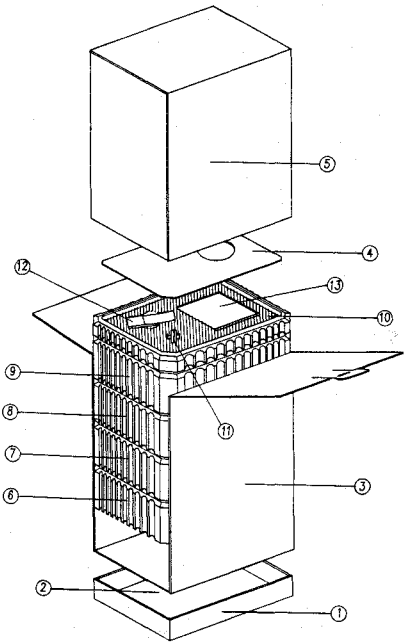

FUNCTION FLOW ③
LSTN
2A
BLANK
BLANK
STOP
FUNCTION FLOW 1
CD
3A-1
TV
3A-2
TUNER
3A-3
TAPE
3A-4
VCR REC ?
NO
YES
RECORDING STOP
FUNCTION FLOW 1
4A-1
4A-2
4A-3
4A-4
4A-5
4A-6
4A-7
5A-1
5A-2
5A-3
5A-4
6A-1
6A-2
6A-3
6A-4


FUNCTION FLOW ④
BLANK
BLANK
3C-3
3C-4


FUNCTION FLOW ⑤
BLANK
BLANK
BLANK
STOP
FUNCTION FLOW 1

SYSTEM PACKING DRAWING

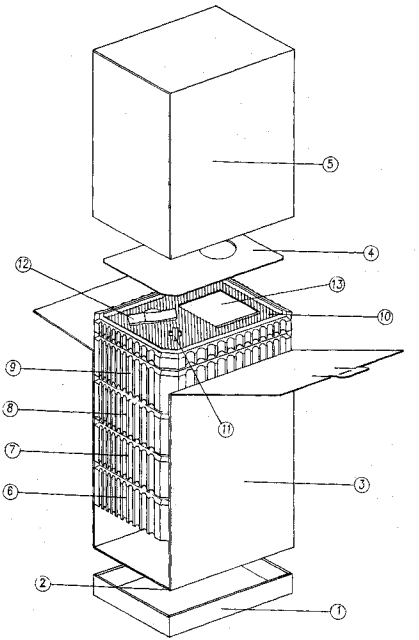
Festival : 300



NO	PARTS NAME	PARTS NO.	Q'TY	REMARK
1	PACKING BASE	3-324-030-02	1	USA,LIB,BB , JPN
2	BASE LID	3-324-031-01	1	USA,LIB,BB , JPN
3	SLEEVE INNER	3-821-103-33	1	USA,LIB,BB , JPN
4	INNER LID	3-324-019-32	1	USA,LIB,BB , JPN
5	CARTON OUT	3-127-815-23	1	LIB,BB
5	CARTON OUT	3-128-607-23	1	USA
5	CARTON OUT	3-131-140-02	1	JPN
6	COP ASS'Y	HK-C0300	1	USA,LIB,BB , JPN
7	DECK ASS'Y	HK-C300	1	USA,LIB,BB , JPN
8	TUNER ASS'Y	HK-T300	1	USA,LIB,BB , JPN
9	AMP ASS'Y	HK-A300	1	USA,LIB,BB , JPN
10	PAD UPPER	3-324-018-02	1	USA,LIB,BB , JPN
11	BATTERY ASS'Y	2-154-204-01	1	USA,LIB,BB , JPN
12	REMOCON ASS'Y	A-221-840-04	1	USA,LIB,BB , JPN
13	MANUAL	3-128-604-04	1	USA,LIB,BB
13	MANUAL	3-131-405-01	1	JPN

SYSTEM PACKING DRAWING

Festival :500

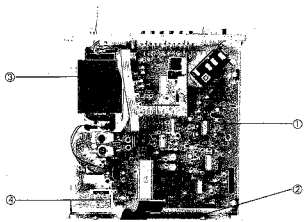


NO	PARTS NAME	PARTS NO.	Q'TY	REMARK
1	PACKING BASE	3-324-030-02	1	USA,J,B,BB . JPN
2	BASE LID	3-324-031-01	1	USA,J,B,BB . JPN
3	SLEEVE INNER	3-821-103-33	1	USA,J,B,BB . JPN
4	INNER LID	3-324-019-32	1	USA,J,B,BB . JPN
5	CARTON OUT	3-127-926-23	1	J,B,BB
5	CARTON OUT	3-128-511-23	1	USA
5	CARTON OUT	3-131-302-02	1	JPN
6	CDP ASS'Y	HK-CD500	1	USA,J,B,BB . JPN
7	DECK ASS'Y	HK-C500	1	USA,J,B,BB . JPN
8	TUNER ASS'Y	HK-T300	1	USA,J,B,BB . JPN
9	AMP ASS'Y	HK-A500	1	USA,J,B,BB . JPN
10	PAD UPPER	3-324-018-02	1	USA,J,B,BB . JPN
11	BATTERY ASS'Y	2-154-204-01	1	USA,J,B,BB . JPN
12	REMOCON ASS'Y	A-221-840-04	1	USA,J,B,BB . JPN
13	MANUAL	3-128-604-04	1	USA,J,B,BB
13	MANUAL	3-131-405-02	1	JPN

1 TUNER

INTERNAL VIEW

■ TOP VIEW



① PCB-1 Main p.c.board
② PCB-2 Control p.c.board
③ Power trans(main)
④ Power trans(sub)

DISASSEMBLY PROCEDURES

1 TOP Cover Removal

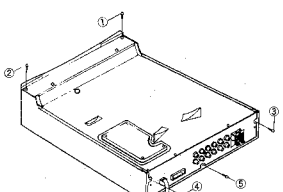


Fig. 1

1. Remove screws ① to ⑤ in Fig. 1
2. Remove the top cover.

2 Rear Panel Removal

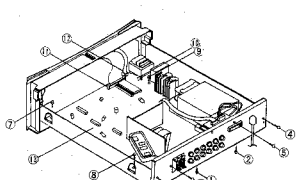


Fig. 2

1. Remove screws ① to ⑥ in Fig. 2, and then remove the rear panel.

3 PCB-⑬ (Main PCB) Removal.

1. Remove the rear panel in Fig. 2(Refer to step 2)
2. Remove connectors ⑪ to ⑫ in Fig. 2, and then remove pcb supports ⑩
3. Remove screws ⑦ to ⑨ in Fig. 2, and then remove the main pcb⑬

4 Front Panel Assembly Removal

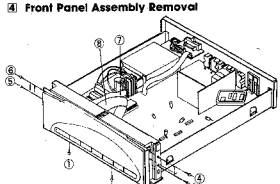


Fig. 3

1. Remove connectors ⑦ to ⑧ in Fig. 3
2. Remove screws ① to ⑤, and then remove the front panel assembly from the unit in Fig. 3

5 PCB-⑥ (Control PCB) Removal.

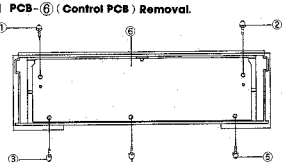


Fig. 4

1. Remove the front panel assembly in Fig. 3. (Refer to step 4)
2. Remove screws ① to ⑤ in Fig. 4, and then remove the control pcb ⑥

Tuner

Condition:Set the volume control maximum
*: Only USA version
** only JPN Version

FM Section

- Set the FM mode by pressing the directional keys to tune up and down the bands.
- Connect the FM signal generator (FM SG) to the FM antenna 75 (*300) ohm terminal through the 75(*300) ohm dummy Antenna.
- Set the Tuner to the FM band

1) Tune the FM SG to the Tuner.
2) connect the FM multiplex stereo signal generator to the FM SG external Modulation terminal
3)

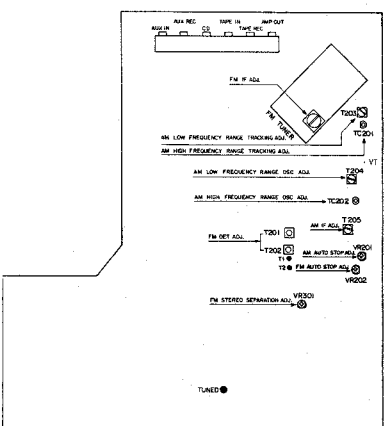
FM signal generator	1 kHz, 40 kHz deviation *1 kHz, 75 kHz deviation **
Stereo modulator	L + R = 22.5(%), L-R = 22.5(%), 19 kHz = 8(%) * L + R = 45.5(%), L-R = 45.5(%), 19 kHz 9(%) **

Step	FM SG(*3)		Tuner Frequency Display	Adjustment Location	Adjustment procedure
	Frequency	Level			
1	No signal		87.5 MHz **76 MHz		Confirm that 1.9V DC±0.5V between terminal V_T and Ground.
2	No signal		108.0MHz **90 MHz		Confirm that 8.0V DC±0.5V between terminal V_T and Ground.
3	98.0 MHz **83 MHz	72 dBf		T 201 T 202	Adjust until the DC voltage is OV±5mV at between TP_1 and TP_2 Adjust until distortion at output L or R terminal is minimum.
4					Repeat steps 3 for optimum the DC voltage and minimum THD
5	98 MHz **83 MHz set to stereo	72 dBf	98.0 MHz **83 MHz	I.F (within±90°)	Adjust until Distortion at output L or R terminal is minimum.
6	98 MHz **83 MHz	38 dBf ±3 dBf *32 dBf ±3 dBf	98.0 MHz **83 MHz	VR 202	Adjust VR202 TEST POINT TUNED become OV at 38 dBf (*32dBf)
7	98 MHz **83 MHz set to stereo	72 dBf	98.0 MHz **83 MHz	VR 301	Adjust until stereo separation at output L or R terminal is maximum.

AM Section

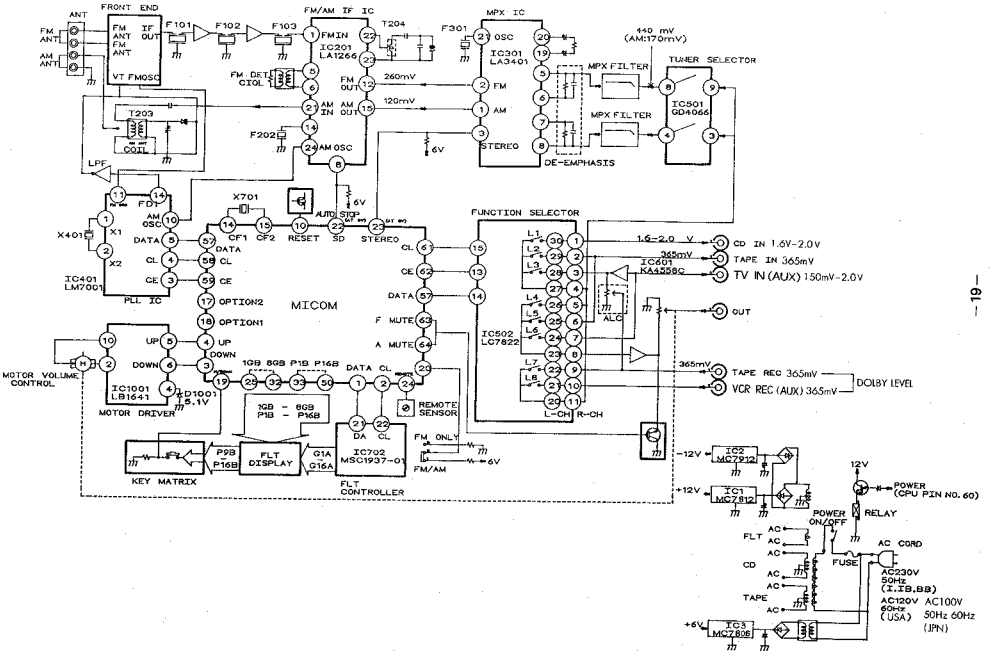
- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator(AM SG) to the AM Antenna terminal

Step	AM SG 1 kHz 30% modulation		Tuner Frequency Display	Adjustment Point	Adjustment procedure
	Frequency	Level			
1	No signal		522 kHz *(520 kHz)	T 204	1.0 V DC between terminal V_T and GND.
2	No signal		1629 kHz *(1710 kHz)	TC 202	8.0V DC between terminal V_T and GND.
3	Repeat steps 1and 2for optimun voltage				
4	603 kHz *(600 kHz)	60 dB μ	603 kHz *(600 kHz)	T 203	Adjust until maximum Sensitivity is obtained
5	1395 kHz *(1400 kHz)	60 dB μ	1395 kHz *(1400 kHz)	TC 201	
6	999 kHz *(1000 kHz)	60 dB μ	999 kHz *(1000 kHz)	T 205	
7	999 kHz *(1000 kHz)	50 dB μ ± 7 dB	999 kHz *(1000 kHz)	VR 201	Adjust VR201 until TEST POINT "TUNED" becomes OV at 50dBμ



Tuner : Adjustment point

TUNER BLOCK DIAGRAM



Tuner

■ FM TUNER SECTION

The FM signal which has entered through the antenna is high-frequency amplified in the front end. Than it is mixed with the output of the local oscillators and converted into the 10.7 MHz intermediate-frequency.

The 10.7 MHz signal is amplified in the intermediate-frequency amplifying section which consist of F101, Q101, Q102, F102, Q103 and F103 and fed to pin 1 of IC201. In IC201, the signal is sent through the IF amplifier and after being detected in the quadrature, it is sent through the post amplifier to pin 12 and then input to pin 2 of IC301. In IC301, the pilot signal is detected and the 38 KHz signal is produced. Then by this signal, stereo signal is demodulated, output from pin 6 for the left channel and from pin 8 for the right channel and transmitted to the input selector section.

■ AM TUNER SECTION

The AM signal which has entered through the antenna passes through the tuning circuit consisting of T203 and is inputted to pin 21 of IC201. In IC201, it undergoes radio-frequency amplification and local oscillation and is output from pin 20, and passed through the transformer (T205) and ceramic filter (F201) and enters pin 18 of IC201. It is then passed through the IF amplification and detection and is output from pin 15. This signal is fed to IC301.

■ SYNTHESIZER SECTION

* FM

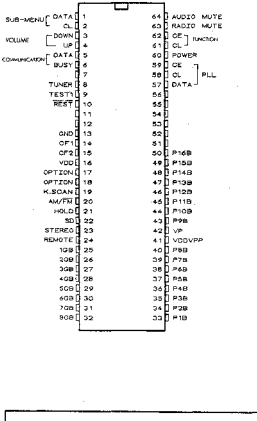
The local oscillator output from the front end is fed to pin11 of the prescaler IC401 and after being frequency devided into 34 or 32, control output is fed from IC701, compared with the devided local oscillator frequency and output to pin 14. This voltage is level converted by Q401 and Q402, and fed to the front end.

* AM

The local oscillation output is fed from pin 24 of IC201 to pin 10 of IC401. In IC401, control output signal is fed from IC701, compared with the local oscillator frequency and output to pin 14. This voltage is level converted by Q401 and Q402, and fed to the AM local oscillator section.

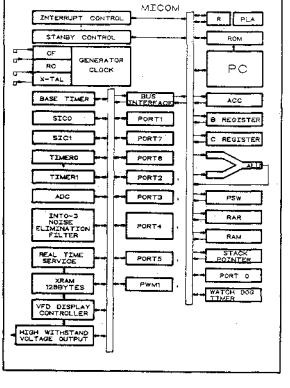
IC FUNCTION BLOCK DIAGRAM

IC701 : MICRO-COMPUTER



MICOM IC TERMINAL FUNCTION TABLE

NE 1054 TERMINAL NAME	No.	INPUT/ OUTPUT	Function Description
DATA	1	OUTPUT	
CL	2	OUTPUT	FLT SUB-MENU
DOWN	3	OUTPUT	
UP	4	OUTPUT	VOLUME
DATA	5	OUTPUT	
BUSY	6	OUTPUT	REMOCON
TUNER	8	OUTPUT	FOR TUNER FUNCTION
TEST1	9	INPUT	Test Terminal(use with open)
REST	10	INPUT	Reset Terminal
—	11	INPUT	
—	12	OUTPUT	
GND	13		GND
OF1	14	OUTPUT	CONNECT QUARTZ OSCILLATOR
OF2	15	OUTPUT	CONNECT QUARTZ OSCILLATOR
VDD	16		Power supply + terminal
OPTION	17	INPUT	
OPTION	18	INPUT	8bit Input port
K.SCAN	19	INPUT	
AM/FM	20	INPUT	
HOLD	21	INPUT	
SO	22	INPUT	8 bit Input port
STEREO	23	INPUT	
REMOTE	24	INPUT	
1GB	25	OUTPUT	
2GB	26	OUTPUT	
3GB	27	OUTPUT	FLT Display Controller(GRID)
4GB	28	OUTPUT	
5GB	29	OUTPUT	
6GB	30	OUTPUT	
7GB	31	OUTPUT	
8GB	32	OUTPUT	
P1B	33	OUTPUT	
P2B	34	OUTPUT	
P3B	35	OUTPUT	FLT Display Controller(Segment)
P4B	36	OUTPUT	
P5B	37	OUTPUT	
P6B	38	OUTPUT	
P7B	39	OUTPUT	
P8B	40	OUTPUT	
VDD	41	—	Power Supply
VP	42	—	Power Supply — (Negative)
P9B	43	OUTPUT	
P10B	44	OUTPUT	
P11B	45	OUTPUT	FLT Display Controller(Segment)
P12B	46	OUTPUT	
P13B	47	OUTPUT	
P14B	48	OUTPUT	
P15B	49	OUTPUT	
P16B	50	OUTPUT	
—	51	—	
—	52	—	
—	53	—	
—	54	—	
—	55	—	
—	56	—	
DATA	57	OUTPUT	PLL Data
CL	58	OUTPUT	
CE	59	OUTPUT	
POWER	60	OUTPUT	Power on/off for remocon
CL	61	OUTPUT	Function Selector
CE	62	OUTPUT	
RADIO MUTE	63	OUTPUT	MUTE FOR RADIO
AUDIO MUTE	64	OUTPUT	MUTE FOR AUDIO



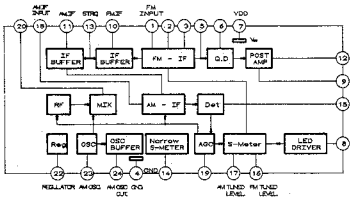
IC 701 OPTION SELECTION

OPTION1 (PIN NO.18)	OPTION2 (PIN NO.17)	BAND RANGE
H	H	FM 76.0MHz ~ 90.0 MHz :100KHz STEP AM 522 KHz ~ 1629 KHz : 9KHz STEP
H	L	FM 87.5MHz ~ 107.9 MHz :200KHz STEP AM 520 KHz ~ 1710 KHz :10KHz STEP
L	H	FM 87.5MHz ~ 108.0 MHz :100KHz STEP AM 520 KHz ~ 1710 KHz :10KHz STEP
L	L	FM 87.50MHz~ 108.00MHz :50KHz STEP AM 522 KHz ~ 1629 KHz :9KHz STEP

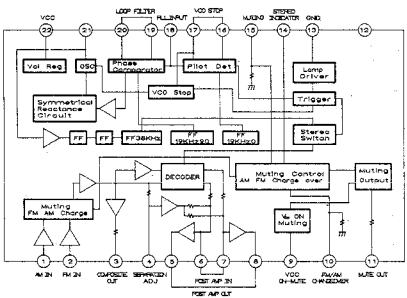
IC 502 FUNCTION SELECTION CHART

MODE SELECTION	OPERATION PIN	IC502 LC7822 L1	L2	L3	L4	L5	L6	L7	L8	IC501 GP4988B
LISTEN MODE	TUNER				ON					ON
	CD	ON			ON					OFF
	TAPE					ON				OFF
	AUX					ON				OFF
RECORD MODE	TUNER=TAPE				ON	ON				ON
	CD =TAPE	ON			ON	ON				OFF
	AUX =TAPE		ON		ON	ON				OFF
	TUNER=AUX						ON	ON		ON
	CD =AUX	ON					ON	ON		OFF
	AUX =AUX		ON				ON	ON		OFF

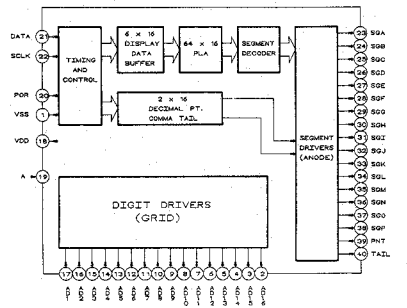
IC201 : LA1266 FM/AM DETECTOR



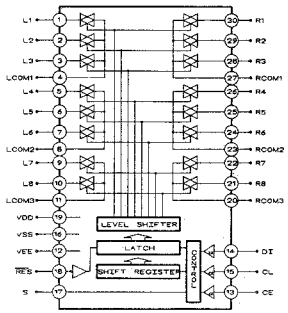
IC301 : MULTIPLEX LA-3401



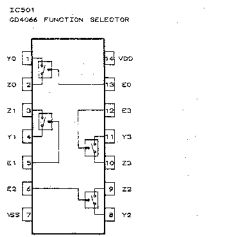
IC702 : MSC 1937-01
FLT SUB MENU INDICATOR



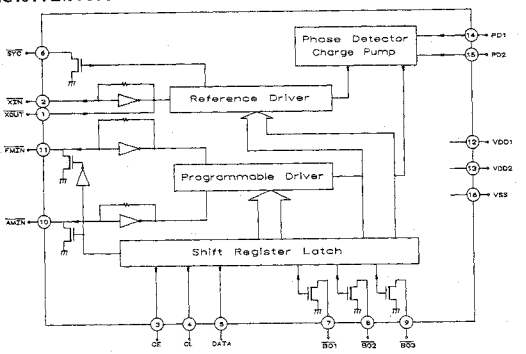
IC502 : LC7822 FUNCTION SELECTOR



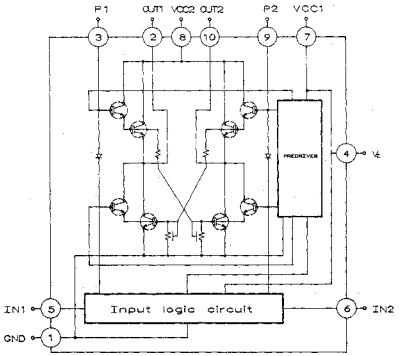
IC501 : GD4066 FUNCTION SELECTOR



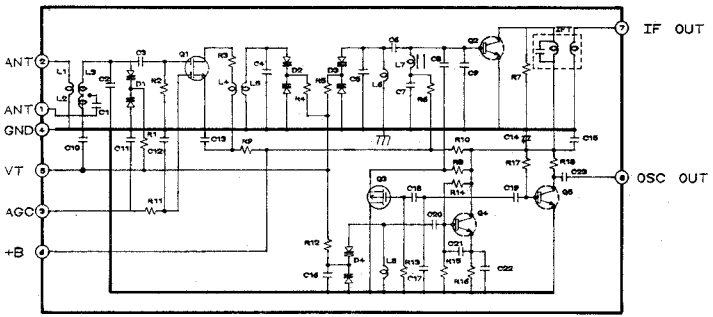
IC401 : LM 7001 PRESCALER



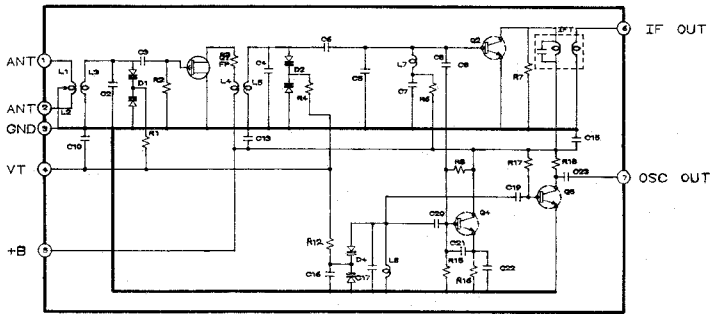
IC1001 : LB1641 MOTOR DRIVE



1. FM FRONT. END(I. IB. BB)
FTH 4-560H



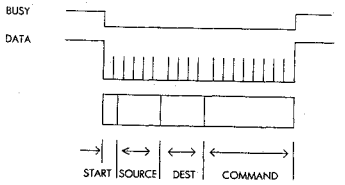
2. FM FRONT. END(USA)(JAPAN)
FTH 3-502H



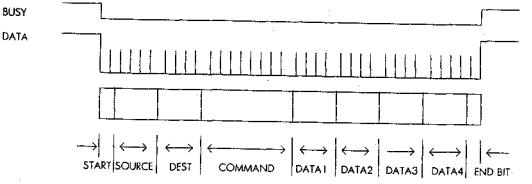
1. System Control Timing Format

Time Base is 560μs

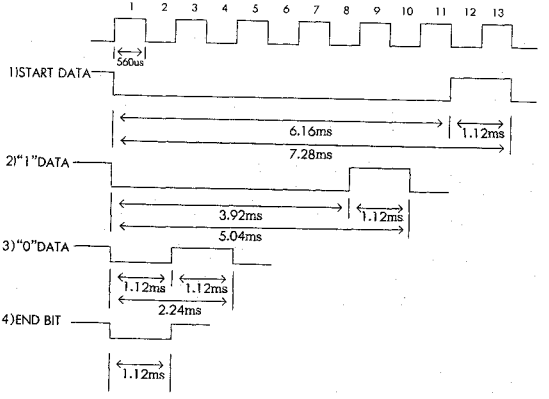
1) COMMAND



2) COMMAND + DATA

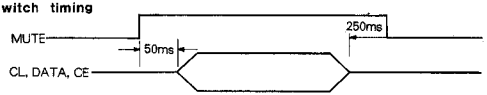


3) BIT WAVEFORM

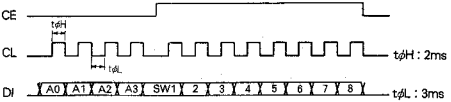


Tuner :

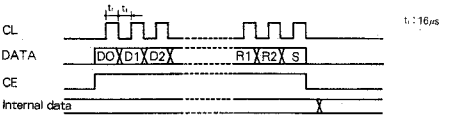
Function switch timing



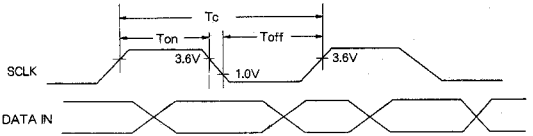
CE, CL, DI waveforms



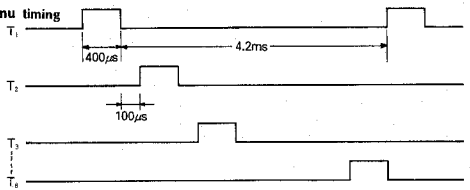
PLL control timing



FLT sub menu control timing

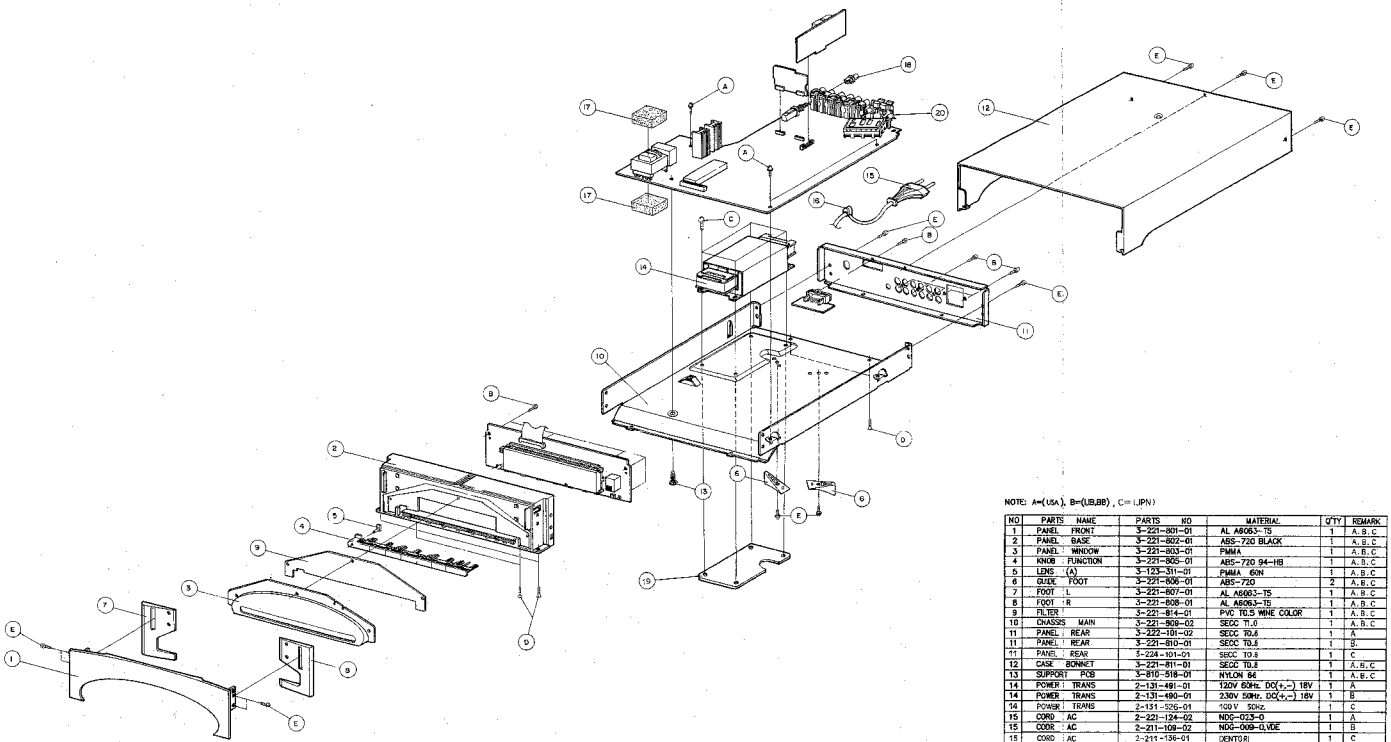


FLT Main menu timing



EXPLODED VIEW

Tuner



NOTE: A=(USA), B=(UB,BB), C=(JPN)

NO	PARTS NAME	PARTS NO	MATERIAL	Q'TY	REMARK
1	PANEL FRONT	3-221-801-01	AL A6063-T5	1	A,B,C
2	PANEL BASE	3-221-802-01	ABS-720 BLACK	1	A,B,C
3	PANEL WINDOW	3-221-803-01	PMMA	1	A,B,C
4	KNOB FUNCTION	3-221-805-01	ABS-720 94-HB	1	A,B,C
5	LENS (A)	3-123-311-01	PMMA 6ON	1	A,B,C
6	GUIDE FOOT	3-221-806-01	ABS-720	2	A,B,C
7	FOOT L	3-221-807-01	AL A6063-T5	1	A,B,C
8	FOOT R	3-221-808-01	AL A6063-T5	1	A,B,C
9	FILTER	3-221-814-01	PVC T0.5 WINE COLOR	1	A,B,C
10	CHASSIS MAIN	3-221-908-02	SECC T1.0	1	A,B,C
11	PANEL REAR	3-222-101-02	SECC T0.6	1	A
11	PANEL REAR	3-221-810-01	SECC T0.6	1	B
11	PANEL REAR	3-224-101-01	SECC T0.6	1	C
12	CASE BONNET	3-221-811-01	SECC T0.8	1	A,B,C
13	SUPPORT PCB	3-810-518-01	NYLON 66	1	A,B,C
14	POWER TRANS	2-131-491-01	120V 60Hz DC(+,-) 18V	1	A
14	POWER TRANS	2-131-490-01	230V 50Hz DC(+,-) 18V	1	B
14	POWER TRANS	2-131-526-01	100V 50Hz	1	C
15	CORD AC	2-221-124-02	NDG-023-0	1	A
15	CORD AC	2-211-109-02	NDG-009-0,VDE	1	B
15	CORD AC	2-211-136-01	DENTORI	1	C
16	BUSHING S/RELIEF	8-201-118-01	HEYCO SR15-1	1	A
16	BUSHING S/RELIEF	8-201-117-01	HEYCO SR14-1	1	B,C
17	CUSHION CHASSIS	3-810-333-01	RUBBER	2	A,B,C
18	KNOB PUSH	3-127-802-01	ABS-720	1	A,B,C
19	COVER SCREW	3-127-803-01	EVA GRAY T5.5X102X66	1	A,B,C
20	TERMINAL ANT	8-201-118-01	4P BLACK	1	A
20	TERMINAL ANT	2-155-742-01	75 OHM PAL+AM	1	A
A	SCREW	7-344-408-01	ATZ30P080FZK	3	A,B
B	SCREW	7-764-410-01	VBZ30P100FZK	6	A,B
C	SCREW	7-768-420-01	VBZ40P200FZK	4	A,B
D	SCREW	7-464-408-01	CBZ30P080FZK	6	A,B
E	SCREW	7-764-408-01	VBZ30P080FZK	21	A,B

arm-00162 / Druck 1

ELECTRICAL PARTS LIST

TUNER T300

REF. No	Part No.	Description
▶1, 18 BB ⊙ JPN.	※: USA	⚠: SAFETY RELATED PARTS.
	PCB–1 MAIN P.C. BOARD	
	INTERGRATED CIRCUITS	
IC701	2-600-154-01-1	LE1044, LC866012 CPU(μ-COM)
IC201	2-441-331-72-1	LA1266 AM.FM IF DET.
IC401	2-441-330-72-1	LM7001
IC301	2-441-353-72-1	LA3401 MPX
IC1001	2-441-348-72-1	LB1641 MOTOR DRIVER
IC502	2-441-361-72	LC7822 FUNCTION SELECTOR
IC501	2-440-807-31	GD40668 FUNCTION SELECTOR
⚠ IC1	2-441-217-71	MC7812 REGULATOR (+12V)
⚠ IC2	2-441-231-71	KA7912 REGULATOR (–12V)
⚠ IC3	2-441-438-42	KA7806 REGULATOR (+6V)
	TRANSISTORS	
Q403, 405, 500	2-400-118-35	KTA1266
Q402	2-402-118-15	KTC3200
Q101, 102, 103	2-402-101-25	KTC3192
▶ Q201	2-402-111-35	KTC3198
Q601, 602, 603, 604, 701	2-402-111-35	KTC3198
Q2002	2-406-107-15	KSR2001
Q1, 2001	2-406-108-15	KSR1001
	FIELD EFFECT TRANSISTOR	
Q401	2-404-111-45-1	2SK246Y
	DIODES	
D201, 202	2-415-080-91-1	SVC321 SPA-DIVARI-CAPI
⚠ D1, 2, 3, 4, 5, 6, 7, 8, 9, 10	2-413-581-65-1	1N4003L
⚠ D11	2-421-220-35	IN 969B, 22V ZENER
D12	2-421-082-45	IN 756A, 8.2V ZENER
D402, 403	2-421-100-35	IN 758A, 10V ZENER
D1001, 501, 502	2-421-051-35	IN 751A, 5.1V ZENER
D401	2-421-056-55	IN 752A, 5.6V ZENER
※ D3001, 3002	2-410-179-95	1SS133
13, 601, 602, 603, 604, 701, 702, 703, 704 711, 710, 2001, 2002, 2003, 2004	2-410-179-95	1SS133
	FILTERS	
F101	2-138-305-01-1	SFE 10.7 MAB-HAIRED)
⊙ ※ F102, 103	2-138-305-01-1	SFF 10.7 MAB-HAIRED)
▶ F102, 103	2-138-306-01-1	SFE 10.7MS 3G-HAIRED)
F201	2-138-312-01-1	SFU 450-B
F202	2-138-313-01-1	BFU 450-C4N
F301	2-138-358-01-1	CSB456F11
▶ F302	2-138-521-01	ANTI BODY
F303, 304	2-138-511-01	19KHz. MPX
▶ F0	2-138-609-01	BPMB6A 88-108MHz
	COILS	
T203	2-127-109-01	M7ZEN-KS29511N
T204	2-129-435-01	AM. OSC
T205	2-127-124-01	AM. IFT
T201	2-129-747-01	FM. DET1
T202	2-129-748-01	FM. DET2
L201	1-011-222-21	RC875, 2.2MH, 5%
L701, 702	1-034-470-35	RC875, 47μH, 5%
	CERAMIC TRIMMERS	
TC201, 202	2-121-170-1	CVCNO68200

REF. No	Part No.	Description
	RESISTORS	
RO, 3, 4, 700	1-114-010-25	1Ω, 1/4W, ±5%
R1003	1-114-150-25	15Ω, 1/4W, ±5%
R1	1-114-682-25	6.8KΩ, 1/4W, ±5%
R2	1-115-332-25	3.3Ω, 1/2W, ±5%
R401	1-114-221-25	220Ω, 1/4W, ±5%
R5, 6	1-118-100-25	10Ω, 1/4W, ±5%
R313, 412, 417	1-118-101-25	100Ω, 1/4W, ±5%
R202, 403, 405, 712, 730, 731	1-118-102-25	1KΩ, 1/4W, ±5%
▶ R120, 504, 720I	1-118-103-25	10KΩ, 1/4W, ±5%
R201, 205, 206, 411, 505, 601, 504, 548 602, 701, 717, 721I	1-118-103-25	10K, 1/4W, ±5%
▶ R218, 320, 321	1-118-104-25	100KΩ, 1/4W, ±5%
R213, 214, 905, 906, 911, 914, 916, 918	1-118-104-25	100KΩ, 1/4W, ±5%
⊙ ※ R203	1-118-123-25	12KΩ, 1/4W, ±5%
R101	1-118-122-25	1.2KΩ, 1/4W, ±5%
R102, 109	1-118-181-25	180Ω, 1/4W, ±5%
R105, 110, 220, 408	1-118-182-25	1.8KΩ, 1/4W, ±5%
▶ R219	1-118-183-25	18KΩ, 1/4W, ±5%
R714	1-118-183-25	18KΩ, 1/4W, ±5%
R100	1-118-220-25	22Ω, 1/4W, ±5%
R409, 521, 523	1-118-221-25	220Ω, 1/4W, ±5%
R104, 606, 607	1-118-222-25	2.2KΩ, 1/4W, ±5%
▶ R314, 315	1-118-155-25	1.5MΩ, 1/4W, ±5%
R106, 407	1-118-271-25	270Ω, 1/4W, ±5%
▶ R203	1-118-273-25	27KΩ, 1/4W, ±5%
R322, 323	1-118-274-25	270KΩ, 1/4W, ±5%
R107, 113, 901, 902, 907, 909, 910	1-118-331-25	330Ω, 1/4W, ±5%
R208, 306, 307, 308, 311	1-118-332-25	3.3KΩ, 1/4W, ±5%
R503	1-118-333-25	33KΩ, 1/4W, ±5%
R103	1-118-395-52	3.9KΩ, 1/4W, ±5%
R514, 515, 600	1-118-470-25	47Ω, 1/4W, ±5%
R410, 1001, 1002	1-118-471-25	470Ω, 1/4W, ±5%
▶ R211, 215	1-118-472-25	4.7KΩ, 1/4W, ±5%
R112, 402, 604, 605, 708, 709, 710	1-118-472-25	4.7KΩ, 1/4W, ±5%
R324, 702, 703, 704, 705, 706, 707, 715, 716	1-118-473-25	47KΩ, 1/4W, ±5%
⊙ ※ R720H	1-118-473-25	47KΩ, 1/4W, ±5%
⊙ R721H	1-118-473-25	47K, 1/4W, ±5%
R603	1-118-474-25	470KΩ, 1/4W, ±5%
R508, 609	1-118-475-25	4.7MΩ, 1/4W, ±5%
R404, 406	1-118-569-25	5.6Ω, 1/4W, ±5%
▶ R216	1-118-560-25	56Ω, 1/4W, ±5%
R204, 114	1-118-560-25	56Ω, 1/4W, ±5%
R111	1-118-561-25	560Ω, 1/4W, ±5%
▶ R310, 549, 550, 740, 741	1-118-562-25	5.6KΩ, 1/4W, ±5%
R207	1-118-680-25	68Ω, 1/4W, ±5%
⊙ ※ R314, 315	1-118-684-25	680KΩ, 1/4W, ±5%
R501, 502	1-118-751-25	750Ω, 1/4W, ±5%
R520, 522	1-118-753-25	75KΩ, 1/4W, ±5%
R903, 904, 912, 913	1-118-151-25	150Ω, 1/4W, ±5%
R211	1-118-563-25	56KΩ, 1/4W, ±5%
R210, 915, 917	1-118-272-25	2.7KΩ, 1/4W, ±5%
▶ R121	1-118-682-25	6.8KΩ, 1/4W, ±5%
⊙ ※ R320, 321	1-118-124-25	120KΩ, 1/4W±5%
※ R3001, 3002	1-118-225-25	2.2M Ω, 1/4W±5%
	SEMI FIXED RESISTORS	
VR201, 202	2-512-473-01	47KΩ, 6MMRH0615CI
VR301	2-512-224-01	220KΩ, 6MMRH0615CI
	CAPACITORS	
C601, 602, 603	1-416-108-65	0.1μF, ±20%, 50V ELEC
C203, 208, 210, 214, 313, 314, 702, 703	1-416-010-65	1μF, ±20%, 50V ELEC
C302, 309, 310, 321, 505, 506 515, 516, 604	1-413-100-65	10μF, ±20%, 16V ELEC
▶ C220, 226, 301	1-413-101-65	100μF, ±20%, 16V ELEC
C228, 318, 405, 513, 517, 600	1-413-101-65	100μF, ±20%, 16V ELEC
C11, 401, 501, 503	1-412-101-65	100μF, ±20%, 10V ELEC
C7	1-415-101-65	100μF, ±20%, 35V ELEC
C4, 5	1-416-101-65	100μF, ±20%, 50V ELEC
C315	1-416-228-65	0.22μF, ±20%, 50V ELEC
C8, 9	1-413-221-65	220μF, ±20%, 16V ELEC
C207	1-416-229-65	2.2μF, ±20%, 50V ELEC
C10	1-413-331-65	330μF, ±20%, 16V ELEC
C407, 408	1-416-475-65	0.47μF, ±20%, 50V ELEC
C305	1-416-479-65	4.7μF, ±20%, 50V ELEC

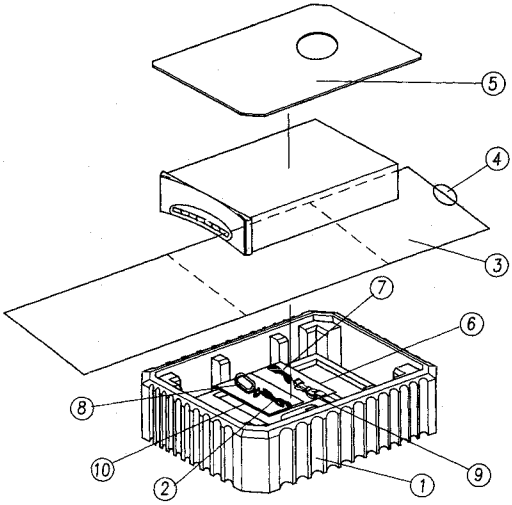
Harm-00162 / Druck 2

REF. No	Part No.	Description	
C13, 100, 211, 219, 1001, 2002	1-413-470-65	47μF, ±20%, 16V	ELEC
C2001	1-412-471-65	470μF, ±20%, 10V	ELEC
C312	1-416-668-65	0.68μF, ±20%, 50V	ELEC
⚠ C1, 2	1-415-222-67	2200μF, ±20%, 35V	ELEC
⊛ ▶ C901, 902, 905, 906, 912, 913	1-599-121-45-1	120 PF, ±5%, 50V	MICA
※ 901, 902, 905, 906 912, 913	1-886-121-45	120PF ±80% −20% 50V	CER
C3, 102, 204, 205, 409, 1002	1-756-103-95	0.01μF, +80%, −20%, 50V	CER
C907, 1003	1-756-104-95	0.1μF, +80% −20%, 50V	CER
C908, 909, 910, 911	1-886-121-45	120 PF, ±5%, 50V	CER
C227	1-886-151-46	150 PF, ±5%, 50V	CER
C410, 411	1-806-180-46	18 PF, ±5%, 50V	CER(CH)
▶ C219	1-756-223-95	0.022μF, +80%, −20%, 50V	CER
C101, 104, 201, 202, 206, 209, 212, 213, 218 224, 225, 319, 402, 406, 502, 504, 514, 518, 707	1-756-223-95	0.022μF, +80%, −20%, 50V	CER
C304, 903, 904	1-886-331-45	330 PF, ±5%, 50V	CER
C303, 700, 420	1-756-473-95	0.047μF, +80%, −20%, 50V	CER
※ 3001, 3002	1-756-473-95	0.047μF +80% −20% +50V	CER
⊛ ※ C307, 308	1-886-681-45	680 PF, ±5%, 50V	CER
▶ C307, 308	1-886-471	470 PF, ±5%, 50V	CER
C704	1-716-682-55	0.0068μF, ±10%, 50V	CER
⚠ ▶ C12	1-998-104-01-1	0.01μF 250V	CER
⊛ ⚠ ※ C12	1-998-101-07	0.01μF 250V	CER
C412 (M)	1-506-473-45	0.047μF, 5%, 50V	MYL
C234(S)	1-506-431-41	430 PF, ±5%, 50V	PPS
C701	1-991-134-01-1	DB-SR5D104	
	MISCELLANEOUS		
X401	2-138-102-01	7.2 MHz	
X701	2-138-184-01-1	CST 8.0 MTW	
▶ FRONT END	2-125-118-01	FTH-560H	
※ FRONT END	2-125-120-01	FTH3-502HA	
⊛ FRONT END	2-125-121-01	FTH3-502H	
SW1	2-202-373-01	SPWN19	
CABLE CARD	2-168-317-01	30P, 150M	
WA1	2-168-307-01	30P, VERTICAL TYPE	
WA8	2-138-382-01-1	2MM, 5P	
WA7	2-168-384-01	2MM, 9P	
WA9, 10	2-168-479-01	BMW250-05, 5P	
WA2	2-168-480-01	YMWO25-02, 2P	
WA6	2-168-482-01	YMWO25-03, 6P	
WA3	2-168-459-01	YW396-03AV, 2P	
WA4	2-168-481-01	YMWO25-03 3P	
CABLE HOLDER	2-163-005-01	6P	
CN1	2-158-579-01	W-DD604 E01	
RCA JACK ＊3	2-155-618-01	4P	
ANT	2-155-742-01	75 OHM, PAL +AM	
※ ANT	2-155-778-01	4P BLACK	
⊛ ANT	2-155-966-01	75 OHM NTSC+AM	
HEATSINK ＊2	3-710-702-03	40MM	
⚠ ▶ REL	2-140-121-01-1	VS-12MBU-5, 12V, 10A	
⊛ ⚠ ※ REL	2-140-225-02-1	JW1AFSN-DC12V	
IC SOCKET	2-155-194-01	WSD1F-64T1.78MM8 IC SOCKET	
⚠ FUSE HOLDER ＊2	2-999-114-01	PBSP-H 0.3T	
⚠ ▶ TRANS2	2-131-476-01	AC 230V 50Hz	
⚠ ※ TRANS2	2-131-369-01	AC 120V 60Hz	
⊛ TRANS2	2-131-527-01	AC 100 V 50Hz	
EARTH WIRE	2-899-601-01	1P 100MM	
TERMINAL WRAPPING ＊6	2-155-377-01	NKC-007-B	
※ EARTH WIRE	2-899-615-01	IP 40MM	
PCB-2 MOTOR CONTROL P.C. BOARD			
	TRANSISTORS		
Q503, 504	2-402-111-34	KTC3198	
Q2003, 2004	2-402-154-25	2 SC 2878-B	
	RESISTORS		
R2001, 2002	1-118-103-25	10 KΩ, 1/4 W, ±5%	
R532, 534	1-118-391-25	390 Ω, 1/4 W, ±5%	
R541, 542	1-118-470-25	47 Ω, 1/4 W, ±5%	
R915, 917	1-118-272-25	2.7 KΩ, 1/4 W, ±5%	
R533, 536	1-114-102-25	1KΩ, 1/4 W, ±5%	
R528, 529	1-118-102-25	1 KΩ, 1/4 W, ±5%	
R531, 537	1-114-154-25	150 KΩ, 1/4 W, ±5%	
R530, 535	1-114-913-25	91 KΩ, 1/4 W, ±5%	

REF. No	Part No.	Description	
		CAPACITORS	
C519, 520	1-413-100-65	10μF, ±20%, 16V	ELEC
C541, 544	1-413-101-65	100μF, ±20%, 16V	ELEC
C1003	1-756-104-95	0.1μF, +80%, -20%, 50	CER
C542, 543	1-756-223-95	0.022μF, +80%, -20%, 50	CER
C530, 531	1-416-689-65	6.8μF ± 20%, 50V	ELEC
		MISCELLANEOUS	
M1	2-501-384-01-1	BLW MOF F25, A54	
WA8-A	2-168-389-01-1	2MM, 5P	
WA7-A	2-168-391-01-1	2MM, 9P	
REF. No	**Part No.**	**Description**	
		PCB-3 BUFFER AMP P.C. BOARD	
		RESISTORS	
R621, 622	1-118-221-25	220Ω, 1/4 W, ±5%	
R623, 625	1-118-472-25	4.7KΩ, 1/4 W, ±5%	
R624, 626	1-118-753-25	75KΩ, 1/4 W, ±5%	
		CAPACITORS	
C623, 624, 626, 627	1-413-100-65	10 μF, ±20%, 16V	ELEC
C621, 622	1-413-470-65	47 μF, ±20%, 16V	ELEC
C625, 628	1-886-330-45	33 PF, 50% 50V	CER
		INTERGRATED CIRCUITS	
IC601	2-441-236-71	KA4558C	
		MISCELLANEOUS	
WA9-A, WA10-A	2-168-478-01	BMH250-05R, 5P	
		PCB-4 CONTROL P.C. BOARD	
		INTERGRATED CIRCUITS	
IC801	2-440-461-401-1	MSC1937-01	
		TRANSISTORS	
Q801, 802, 803	2-406-108-15	KSR1001	
		DIODES	
D810, 811, 812, 813, 814, 815, 816, 817 818, 819	2-410-179-95	1SS133	
		RESISTORS	
R807, 841	1-118-101-25	100Ω, 1/4 W, ±5%	
R804	1-118-103-25	10KΩ, 1/4 W, ±5%	
R806	1-118-123-25	12KΩ, 1/4 W, ±5%	
R801	1-118-180-25	18Ω 1/4 W, ±5%	
R802	1-118-222-25	2.2KΩ 1/4 W, ±5%	
R805	1-118-331-25	330Ω 1/4 W, ±5%	
R808, 811, 812, 813, 814, 815, 816, 817 818, 819, 820, 821, 823, 824, 825 826, 827, 828, 829, 830, 831, 832, 833 834, 835, 836, 837, 838, 839, 840-803	1-118-473-25	47KΩ, 1/4 W, ±5%	
		CAPACITORS	
C804	1-413-470-65	CEA 47μF, ±20%, 16V	ELEC
C802, 803	1-414-470-65	CEA 47μF, ±20%, 25V	ELEC
		MISCELLANCEOUS	
S801, 802, 803, 804, 805, 806, 807, 808	2-208-990-1	177-620-002	
FLT	2-143-255-01	24-MT-01GK	
WA1-A	2-168-289-01	30P, ANGLE TYPE	
REMOTE	2-125-816-01	KRM-91M(38KHz)	
FLT HOLDER	3-221-804-01	ABS	
IDB12	2-419-183-35	854MC F07	
CABLE HOLDER	2-163-903-01	4P	
EARTH WIRE	2-899-601-01	1P 100MM	
		PCB-5 RIBBON P.C. BOARD	
WA5	2-168-469-01	13P BLACK	
WA6	2-168-482-01	YMW 025-06 6P	
CABLE HOLDER	2-163-005-01	6P	
FUSE * 2	2-998-225-01-1	T1A/250V	
		MISCELLANCEOUS	
⚠ ▶ TRANS1	2-131-490-01	AC230V 50HZ	
⚠ ※ TRANS1	2-131-491-01	AC120V60HZ	
⊕ ⚠ TRANS1	2-131-526-01	AC 100 V 50Hz	

PACKING DRAWING

Tuner

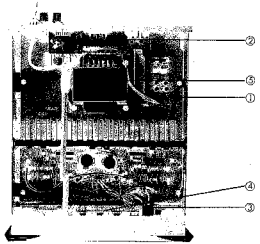


NO	PARTS NAME	PARTS NO.	Q'TY
1	PAD BOTTOM	3-127-916-01	1
2	PIN CORD	2-212-141-01	2
3	SHEET POLY	3-324-029-01	1
4	STICKER SET	3-819-817-01	1
5	INNER LID	3-324-019-01	1
6	BAG POLY	3-219-009-01	1
7	ANT FM	2-213-103-01	1
7	ANT FM	2-213-104-01	1
8	LOOP ANTENNA AM	2-213-353-02	1
9	CONNECTOR ASS'Y	2-159-978-02	1
10	MANUAL SHEET	3-221-823-01	1
10	MANUAL SHEET	3-224-102-01	1
11	ANT ADAPTER	2-155-967-01	1

2 HK-A300

INTERNAL VIEW

■ TOP VIEW



① PCB-1 Main p.c.board
② PCB-2 Power Transformer p.c.board
③ PCB-3 Control p.c.board
④ PCB-4 Control p.c.board
⑤ Power Transformer.

DISASSEMBLY PROCEDURES

1 TOP Cover Removal

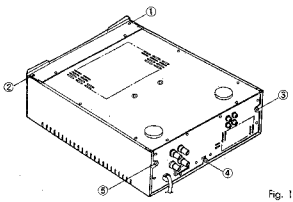


Fig. 1

1. Remove screws ① to ⑤ in Fig. 1
2. Remove the top cover

2 Bottom Cover Removal

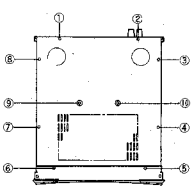


Fig. 2

1. Remove screws ① to ⑩, and then remove the bottom cover in Fig. 2

3 Rear Panel Removal

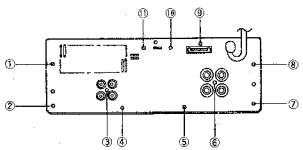


Fig. 3

1. Remove screws ① to ⑨, and then remove the rear panel in Fig.3

4 5 PCB-⑦ (Power Transformer PCB) Removal

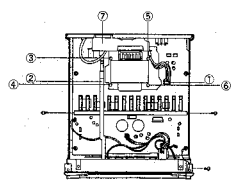


Fig. 4

1. Remove the rear panel in Fig. 3 (Refer to step 3)
2. Remove connector ①, Remove Switch rod ② from speaker selector switch
3. Remove screws ③ to ⑥, and then remove the pcb-2(⑦) with the power trans

5 PCB-⑮(Main PCB) Removal

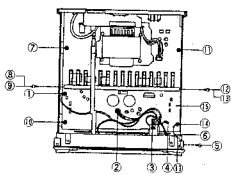


Fig · 5

1. Remove the pcb-2(Refer to step 4)
2. Remove connectors ① to ④ in Fig. 5
3. Remove screws ⑤, and then untie the ground wire Ⓐ in Fig. 5
4. Remove screws ⑦ to ⑭, and then remove the main pcb-⑮

6 Front Panel Assembly Removal

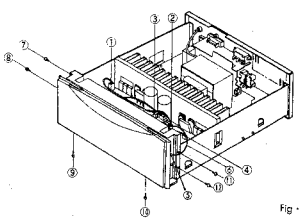


Fig · 6

1. Remove connectors ① to ④ in Fig · 6
2. Remove screws ⑤, and then untie the ground wire Ⓐ in Fig. 6
3. Remove screws ⑦ to ⑫, and then remove the front panel assembly by pulling it toward you gently.

7 PCB-③, ⑦(Control PCB) Removal.

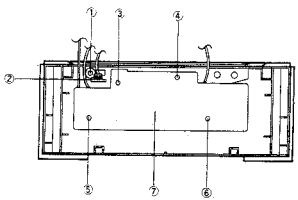


Fig · 7

1. Remove the front panel assembly from the unit in Fig · 6 (Refer to step 6)
2. Remove screws①, and then remove the pcb-3 ② in Fig. 6
3. Remove screws ③ to ⑥, and then remove the pcb-4 ⑦ in Fig. 6

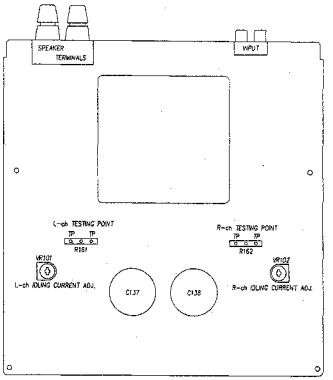
Amplifier : A-300

Conditions:
- Set the Volume control of Tuner to minimum.
- Set the Speaker switches to "off" position.
- Make the adjustment at a room temperature of 77°F (25°C).
- After the Power Switch of Tuner is pushed on, Wait for 60 minutes before measuring to be sure of the most stable operation.

⚠ NOTE :
- Power amplifier can be serviced without TUNER by shorting Points PIN No. AC1 and JUMPER WIRE No. J93
- DC OFFSET VOLTAGE should be less than 100mV after POWER ON 12sec.

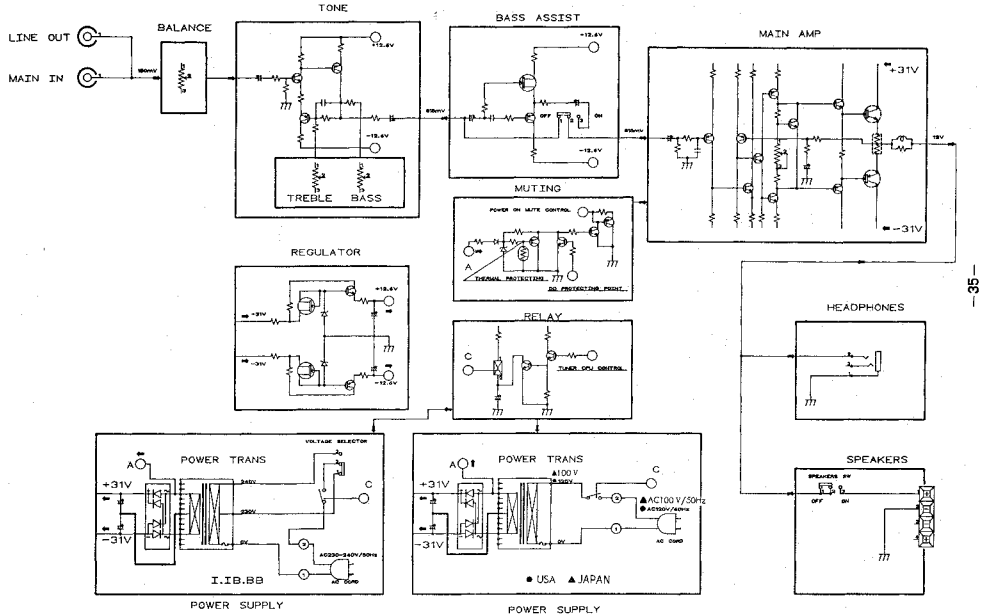
■ IDLING CURRENT ADJUSTMENT

STEP	Connection Equipments	Adjustment	FOR
1	Connect the Digital Volt Meter to both side of R161	VR101L-Ch	26mV±2mV
2	Connect the Digital Volt Meter to both side of R162	VR102R-ch	26mV±2mV



A300 Adjustment point

A-300 AMPLIFIER BLOCK DIAGRAM



Amplifier : A300

■ TONE CONTROLS.

Fig 1 shows the basic tone control circuit. The tone amplifier is a DC-coupled amplifier

The tone circuit consisstitutes INPUT small signal Transistor (Q201) OUTPUT small signal Transistor (Q205) and CONSTANT current Transistor (Q203). Tone control (Bass, Treble) is accomplished by providing the tone amplifier NFB circuit with a frequency selective characteristic. (Bass:50Hz, Treble:10kHz)

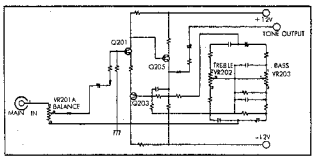


Fig. 1

■ BASS ASSIST

Fig 2 shows the BASS ASSIST circuit.

The BASS ASSIST circuit consists of CONSTANT current F. E. T (Q207) and small signal transistors (Q209, Q211).

This curcuit is active low cut filter. (Accent frequency is 55Hz).

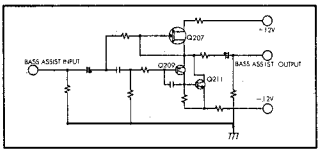


Fig. 2

■ POWER AMPLIFIER SECTION

The basic circuit arrangement of the power amplifier is shown in Fig 3. The first stage is a differential amplifier comprising PNP two transistors (Q103, 107).

The pre-drive stage consists of ultra low capacitance transistors (Q113, Q115).

The power stage bias voltage is supplied by the transistor (Q117).

The power stage consists of drive transistors (Q119, Q121) and power transistors (Q125, Q127).

The power amplifer has a over-output current protection circuit. If current exceeding the specification flows through Q125 & Q127(L-ch), Q123 & Q135 Will conduct. As result Q133 will switch OFF, and the mute line will go low(MUTE). The thermal protection circuit consists of Transistors (Q134, Q138) and positor PO 101. When heat sink temperature exceeds 95℃, Q136 & Q134 switch ON and the MUTE line goes low(MUTE).

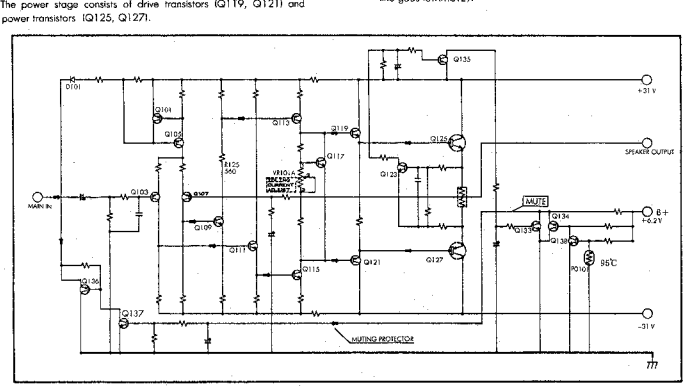
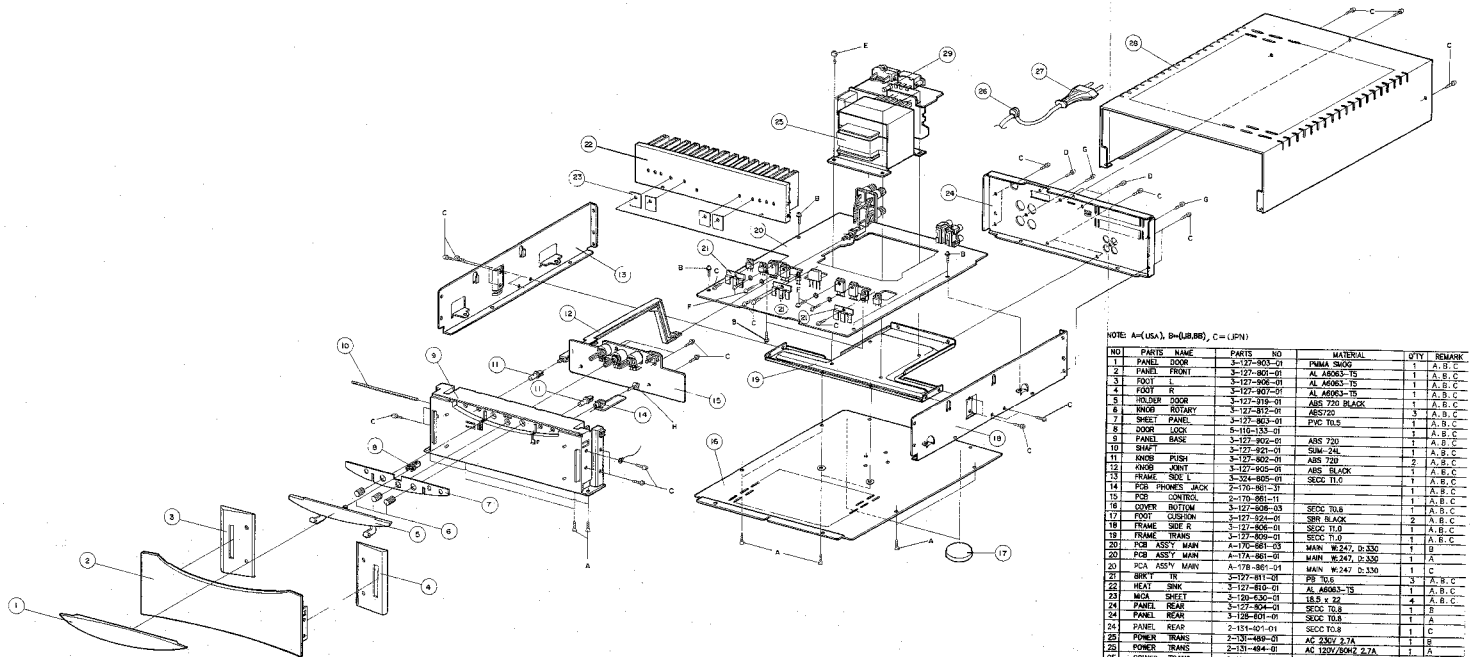


Fig. 3

EXPLODED VIEW

Amplifier : A300



NOTE: A=(USA), B=(UB,BB), C=(JPN)

NO	PARTS NAME	PARTS NO	MATERIAL	Q'TY	REMARK
1	PANEL DOOR	3-127-803-01	PMMA SMOG	1	A,B,C
2	PANEL FRONT	3-127-801-01	AL A6063-T5	1	A,B,C
3	FOOT L	3-127-906-01	AL A6063-T5	1	A,B,C
4	FOOT R	3-127-907-01	AL A6063-T5	1	A,B,C
5	HOLDER DOOR	3-127-919-01	ABS 720 BLACK	1	A,B,C
6	KNOB ROTARY	3-127-812-01	ABS720	3	A,B,C
7	SHEET PANEL	3-127-803-01	PVC T0.5	1	A,B,C
8	DOOR LOCK	3-110-133-01		1	A,B,C
9	PANEL BASE	3-127-902-01	ABS 720	1	A,B,C
10	SHAFT	3-127-921-01	SUM-24L	1	A,B,C
11	KNOB PUSH	3-127-902-01	ABS 720	2	A,B,C
12	KNOB JOINT	3-127-905-01	ABS BLACK	1	A,B,C
13	FRAME SIDE L	3-324-805-01	SECC T1.6	1	A,B,C
14	PCB PHONES JACK	2-170-861-31		1	A,B,C
15	PCB CONTROL	2-170-861-11		1	A,B,C
16	COVER BOTTOM	3-127-908-03	SECC T0.8	1	A,B,C
17	FOOT CUSHION	3-127-924-01	SBR BLACK	2	A,B,C
18	FRAME SIDE R	3-127-806-01	SECC T1.0	1	A,B,C
19	FRAME TRANS	3-127-809-01	SECC T1.0	1	A,B,C
20	PCB ASS'Y MAIN	A-170-861-03	MAIN W.247, D:330	1	B
20	PCB ASS'Y MAIN	A-170-861-01	MAIN W.247, D:330	1	A
20	PCA ASS'Y MAIN	A-178-861-01	MAIN W.247 D:330	1	C
21	BRK'T TR	3-127-811-01	PB T0.6	3	A,B,C
22	HEAT SINK	3-127-810-01	AL A6063-T5	1	A,B,C
23	MCA SHEET	3-129-630-01	18.5 x 22	4	A,B,C
24	PANEL REAR	3-127-804-01	SECC T0.8	1	B
24	PANEL REAR	3-128-801-01	SECC T0.8	1	A
24	PANEL REAR	3-131-491-01	SECC T0.8	1	C
25	POWER TRANS	2-131-469-01	AC 230V 2.7A	1	B
25	POWER TRANS	2-131-494-01	AC 120V/60HZ 2.7A	1	A
25	POWER TRANS	2-131-529-01	AC 100 V/50,60Hz,3A	1	C
26	BUSHING R/STRAIN	8-201-117-01	HEYCO SR-14-1	1	B
26	BUSHING R/STRAIN	8-201-118-01	HEYCO SR-15-1	1	A
27	CORD AC	2-211-109-02	MDG-029 VDE	1	B,C
27	CORD POWER	2-211-124-02	MDG-023-Q	1	A
27	CORD POWER	2-211-156-01	125V 7A	1	C
28	TOP COVER	3-127-807-01	SECC T0.8 SPRAY	1	A,B,C
29	FUSE	2-185-818-01	5.2 x 20 250V 1.25A	1	B
29	FUSE	2-185-840-01	5.2 x 20 250V 2.5A	1	
29	FUSE	2-185-142-01	5.2 x 20 250V 2.5A	1	C
A	SCREW	7-464-406-01	CB/3X8P/C2FZK	10	A,B,C
B	SCREW	7-344-408-01	ATZ/3X8P/C2FZK	6	A,B,C
C	SCREW	7-764-408-01	VBZ/3X8P/B2FZK	46	A,B,C
D	SCREW	7-764-410-01	VBZ/3X10P/C2FZK	3	A,B,C
E	SCREW	7-768-408-01	VBZ/4X8P/C2FZK	4	A,B,C
F	SCREW	7-999-164-01	VBZ/3X12P/C2FZK-SPRING	4	A,B,C
G	SCREW	7-999-166-01	PTB/3X8P/C2FZK	2	A,B,C
H	SCREW	7-999-163-01	S/3DC	1	A,B,C

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Amplifier A300 ⊙JPN

Ref. No	Part No.	Description
	CHASSIS MISCELLANEOUS	
⚠ PI	2-211-109-02	AC LINE CORD (I, IB, BB)
	2-211-124-02	AC LINE CORD (USA)
⊙	2-211-136-01	AC LINE CORD (JPN)
⚠ TI	2-131-489-01	POWER TRANSFORMER (I, IB, BB)
	2-131-494-01	POWER TRANSFORMER (USA)
⊙	2-131-529-01	POWER TRANSFORMER (JPN)
⚠ FU301	2-188-619-01	FUSE (1.25A/250V (I, IB, BB)
	2-188-640-01	FUSE (2.5A/250V (USA)
⊙	2-188-142-01	FUSE (2.5A/250V (JPN)
	PCB-1 MAIN (P.C. BOARD)	
	RESISTOR	
⚠ R161, 162	1-390-214-01	0.22Ω, 5W+5W
⚠ R165, 166	1-141-100-23	10Ω, 1W, ±5%
⚠ R185, 186	1-141-681-23	680Ω, 1W±5%
⚠ R183, 184	1-304-479-25	4.7Ω, 1/4W, ±5% FUSE
⚠ R141, 142, 147, 148	1-304-470-25	47Ω, 1/4W, ±5% FUSE
⚠ R177, 178	1-304-331-25	330Ω, 1/4W, ±5% FUSE
⚠ R163, 164	1-304-100-25	10Ω, 1/4W, ±5% FUSE
R167, 174	1-114-104-25	100KΩ, 1/4W, ±5%
R109, 110	1-114-103-25	10KΩ, 1/4W, ±5%
R159, 160	1-114-102-25	1KΩ, 1/4W, ±5%
R113, 114, 115, 116, 135, 136	1-114-152-25	1.5KΩ, 1/4W, ±5%
R143, 144, 145, 146	1-114-223-25	22KΩ, 1/4W, ±5%
R169	1-114-222-25	2.2KΩ, 1/4W, ±5%
R101, 102	1-118-222-25	2.2KΩ, 1/8W, ±5%
R179, 180	1-114-220-25	22 Ω, 1/4W, ±5%
R131, 132	1-114-272-25	2.7KΩ, 1/4W, ±5%
R119, 120	1-114-271-25	270Ω, 1/4W, ±5%
R103, 104, 107, 108, 170	1-114-333-25	33KΩ, 1/4W, ±5%
R176, 187	1-114-332-25	3.3KΩ, 1/4W, ±5%
R105, 106, 155, 156	1-114-331-25	330 Ω, 1/4W, ±5%
R149, 150	1-114-363-25	36KΩ, 1/4W, ±5%
R177	1-114-392-25	3.9KΩ, 1/4W, ±5%
R153, 154, 172, 173, 175	1-114-472-25	4.7KΩ, 1/4W, ±5%
R111, 112, 117, 118, 178	1-114-471-25	470 Ω, 1/4W, ±5%
R121, 122, 123, 124, 125, 126, 127, 128, 129, 130	1-114-561-25	560 Ω, 1/4W, ±5%
R133, 134, 139, 140	1-114-560-25	56 Ω, 1/4W, ±5%
R168, 171	1-114-683-25	68KΩ, 1/4W, ±5%
R158	1-114-821-25	820 Ω, 1/4W, ±5%
R151, 152	1-114-820-25	82 Ω, 1/4W, ±5%
R157	1-114-911-25	910Ω, 1/4W, ±5%
R137, 138	1-114-391-25	390Ω, 1/4W, ±5%
	CONTROLS	
VR101, 102	2-512-471-01	470Ω
	CAPACITOR	
C129, 142	1-416-010-65	1μF, ±20%, 50V, ELEC
C115, 116	1-413-100-65	10μF, ±20%, 16V, ELEC
C140, 141	1-416-100-65	10μF, ±20%, 50V, ELEC
C130	1-412-101-65	100pF, ±20%, 10V, ELEC
C131, 132, 133, 134	1-414-221-65	220μF, ±20%, 25V, ELEC
C103, 104	1-412-470-65	47μF, ±20%, 10V, ELEC
C119, 120	1-414-479-65	4.7μF, ±20%, 25V, ELEC
C109, 110, 111, 112, 135, 136	1-416-470-65	47μF, ±20%, 50V, ELEC
C111, 112	1-411-471-65	470pF, ±20%, 6.3V, ELEC
⚠ C137, 138	1-991-131-01	6800pF, ±20%, 50V, ELEC
⚠ C139	1-998-104-01-1	10000pF, ±5% 250V (I, IB, BB)
	1-998-101-07	10000PF, ±5% 250V (USA)
C117, 118	1-599-101-45	100PF, ±5% 100V (I, IB, BB)
	1-886-101-45	100PF, ±5% 50V (USA)
C143, 144, 145, 146, 149, 150	1-756-104-95	100000pF, ±80%,-20% 50V (I, IB, BB)
C127, 128, 101, 102, 147, 148	1-599-151-45	150PF, ±5%, 100V (I, IB, BB)
C113, 114	1-886-050-15	5pF, ±5%, 50V
C105, 106	1-599-680-45	680PF, ±5% 100V (I, IB, BB)
	1-886-680-45	680PF, ±5% 50V (USA)

REF. No	Part No.	Description
C123, 124, 125, 126	1-506-104-45	100000pF, 5% 50V
C121, 122	1-506-683-45	47000μF, 5% 50V
	TRANSISTORS	
⚠ Q125, 126	2-403-103-21	KTD718-O
⚠ Q127, 128	2-401-108-11	KTB688-O
Q115, 116	2-402-116-41-1	2SC3787S
Q113, 114	2-400-117-41-1	2SA1477S
Q119, 120	2-402-173-21	KTC4370Y
Q121, 122	2-400-151-12	KTA1659Y
⚠ Q130	2-403-106-12	KTD1351Y
⚠ Q129	2-401-103-21	KTB988Y
Q117, 118, 133, 138	2-402-111-35	KTC3198GR
Q101, 102, 105, 106, 134	2-400-118-35	KTC1266GR
Q109, 110, 111, 112, 123, 124, 137	2-400-118-35	KTC3200BL
Q103, 104, 106, 107, 135, 136	2-400-114-25	KTC1268BL
	F.E.T	
Q131, 132	2-404-118-15-1	2SK373
	DIODES	
⚠ D107	2-413-091-67-1	PBL403
⚠ D106	2-413-581-65-1	1N403L
D101, 102	2-410-179-95	1SS133
⚠ D103, 104	2-421-130-35	ZENER, 1N964, 13V
⚠ D105	2-421-062-45	ZENER, 1N753, 6.2V
	COILS	
L101, 102	2-129-305-01	0.7μH
	MISCELLANEOUS	
P0101	2-505-121-01-1	POSISTOR
S101	2-202-373-01	PUSH SWITCH
SPEAKER TERMINAL	2-155-777-01	5P SCREW TYPE
INPUT JACK	2-155-618-01	4P PIN JACK GOLD
WA104	2-168-134-01	WAFER 3P
WA103, 105	2-168-122-01	WAFER 3P
WA101, 102	2-168-123-01	WAFER 4P
LUG	2-899-607-01	EARTH WIRE
	PCB-2 CONTROL P.C. BOARD	
	CONTROLS	
VR201	2-501-220-21	250KΩ, MN
VR202, 203	2-501-219-01	100KΩ, 20C
	RESISTORS	
R249, 250, 207, 208	1-118-104-25	100KΩ, 1/8W, ±5%
R251, 252	1-118-103-25	10KΩ, 1/8W, ±5%
R217, 218, 221, 222	1-118-102-25	1KΩ, 1/8W, ±5%
R219, 220, 239, 240	1-118-101-25	100 Ω, 1/8W, ±5%
R201, 202	1-118-122-25	1.2KΩ, 1/8W, ±5%
R215, 216, 207, 208	1-118-154-25	150KΩ, 1/8W, ±5%
R209, 210	1-118-153-25	15KΩ, 1/8W, ±5%
R237, 238	1-118-224-25	220KΩ, 1/8W, ±5%
R231, 232	1-118-222-25	2.2KΩ, 1/8W, ±5%
R229, 230	1-118-221-25	220 Ω, 1/8W, ±5%
R211, 212	1-118-271-25	2.7KΩ, 1/8W, ±5%
R223, 224	1-118-274-25	270KΩ, 1/8W, ±5%
R213, 214, 225, 226, 245, 248	1-118-331-25	330 Ω, 1/8W, ±5%
R203, 204	1-118-391-25	390 Ω, 1/8W, ±5%
R205, 206, 235, 236	1-118-473-25	47KΩ, 1/8W, ±5%
R243, 244, 246, 247	1-118-479-25	4.7 Ω, 1/8W, ±5%
R241, 242	1-118-562-25	5.6KΩ, 1/8W, ±5%
R227, 228	1-118-820-25	82 Ω, 1/8W, ±5%
R233, 234	1-118-330-25	33 Ω, 1/8W, ±5%

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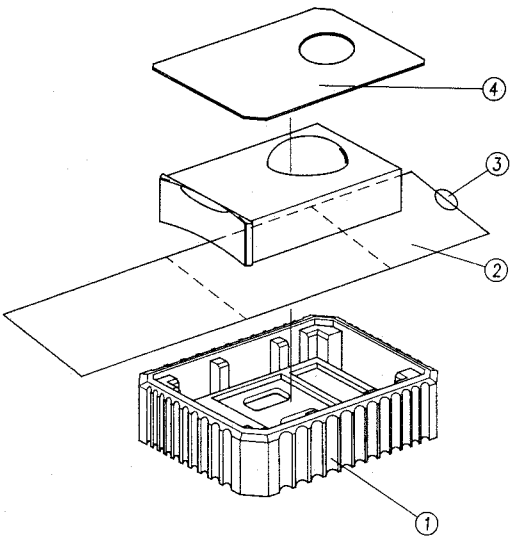
REF. No	Part No.	Description
	CAPACITORS	
C219, 220	1-416-108-65	0.1μF, ±20%, 50V ELEC
C205, 206	1-416-229-65	2.2μF, ±20%, 50V ELEC
C211, 212, 213, 214	1-413-220-65	22μF, ±20%, 16V ELEC
C223, 224	1-416-478-65	0.47μF, ±20%, 50V ELEC
C217, 218, 226, 227	1-413-470-65	47μF, ±20%, 16V ELEC
C210, 209	1-506-154-41	150000pF, ±5%, 50V
C207, 208	1-506-273-45	27000pF, ±5%, 50V
C201, 202	1-506-363-45	36000pF, ±5%, 50V
C221, 222	1-506-473-45	47000pF, ±5%, 50V
C203, 204	1-506-682-45	6800pF, ±5%, 50V
C215, 216	1-886-330-45	33pF, ±5%, 50V
C228, 229	1-886-100-45	10pF, ±5%, 50V
	TRANSISTORS	
Q201, Q202	2-402-111-35	KTC3198GR
Q203, 204, 205, 206	2-400-118-35	KTA1266GR
Q211, 212	2-402-118-25	KTC3200BL
Q209, 210	2-400-114-25	KTC1268BL
	F.E.T	
Q207, 208	2-404-111-35-1	2SK246GR
	MISCELLANEOUS	
S201	2-202-198-01	PUSH SWITCH
CW103	2-159-889-02	CONNECTOR ASS'Y 3P
CW101	2-159-790-01	CONNECTOR ASS'Y 4P
CW102	2-159-892-02	CONNECTOR ASS'Y 4
	PCB-3 POWER RELAY P.C. BOARD	
	RESISTOR	
R304	1-114-110-02-2	10Ω, 1W
R303	1-118-152-25	1.5KΩ, 1/8W, ±5%
R301	1-118-472-25	4.7KΩ, 1/8W, ±5%
	CAPACITOR	
C301	1-419-010-65	1μF, 20%, 100V, ELEC
C302	1-998-104-01-1	10000pF, ±5%, 250V (LIB,BB)
	1-998-101-07	10000pF, ±5%, 250V (USA)
	TRANSISTORS	
Q301, 302	2-402-111-35	KTC3198GR
	DIODE	
D301	2-410-179-95	1SS133
	RELAY	
⚠ RY301	2-140-225-02	JW1AF5N-DC12V
	MISCELLANEOUS	
⚠ S301	2-190-179-01	SLIDE SWITCH
CW104	2-159-982-01	CONNECTOR ASS'Y 3P
	PCB-4 HEADPHONES P.C. BOARD	
PHONES JACK	2-155-650-01	3P MINI JACK
CW105	2-159-643-01	CONNECTOR ASS'Y 3P

PACKING DRAWING

Amplifier : A-300

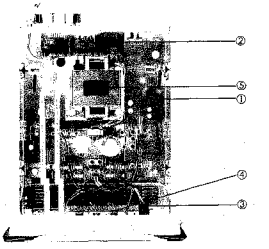


NO	PARTS NAME	PARTS NO.	Q'TY
1	PAD BOTTOM	3-127-916-01	1
2	SHEET POLY	3-324-029-01	1
3	STICKER SET	3-819-817-01	1
4	INNER LID	3-324-019-01	1

3 HK-A500

INTERNAL VIEW

■ TOP VIEW



① PCB-1 Main p.c.board
② PCB-2 power Transformer p.c.board
③ PCB-3 Control p.c.board
④ PCB-4 Control p.c.board
⑤ Power transformer

DISASSEMBLY PROCEDURES

1 TOP Cover Removal

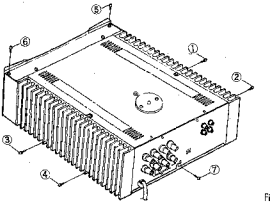


Fig. 1

1. Remove screws ① to ⑦ in Fig. 1
2. Remove the top cover

2 Bottom Cover Removal

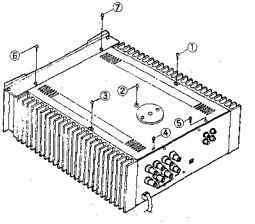


Fig. 2

1. Remove screws ① to ⑦ in Fig. 2, and then remove the bottom cover.

3 Rear Panel Removal

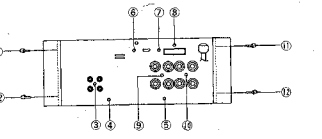


Fig. 3

1. Remove screws ① to ⑫ in Fig. 3, and then remove the rear panel

4 PCB-⑤ (Power TransFormer PCB)Removal

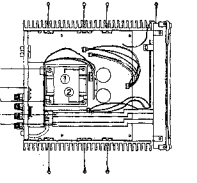


Fig. 4

1. Remove the rear panel in Fig.3 (Refer to step 3)
2. Remove screws ① to ④ in Fig. 4, and then remove the pcb-2 ⑤ with the power transformer
3. Remove switch rods ② to ⑦ and speaker selector switch in Fig. 4

5 PCB-⑱(Main PCB)Removal

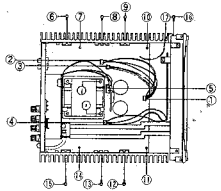


Fig · 5

1. Remove the pcb-2 and power trans (Refer to step 4).
2. Remove connectors ① to ⑤ in Fig · 5, and then remove screws ⑥ to ⑬
3. Remove screw ⑱ in Fig · 5, and then untie the ground wire ⑰
4. Remove the pcb-⑱ Fig. 5

6 Front Panel Assembly Removal

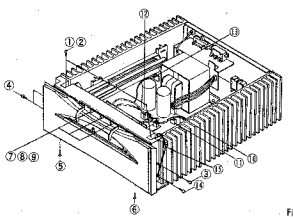


Fig. 6

1. Remove the rotary knobs ⑦ to ⑫ in Fig. 6
2. Remove connectors ⑭ to ⑯ in Fig. 6
3. Remove screw ⑲ and then unite the ground wire ⑬ in Fig · 6
4. Remove screws ① to ⑥ in Fig · 6, and then remove the front panel assembly by pulling it toward you gently.

7 PCB-②, ⑦(Control PCB)Removal.

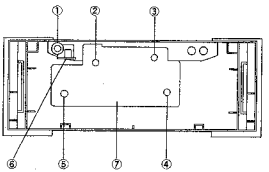


Fig · 7

1. Remove the front panel assembly (Refer to step 6)
2. Remove screw ①, in Fig · 7, and then remove pcb-3 ⑥
3. Remove screws ② to ⑤, in Fig. 7, and then remove pcb-4 ⑦

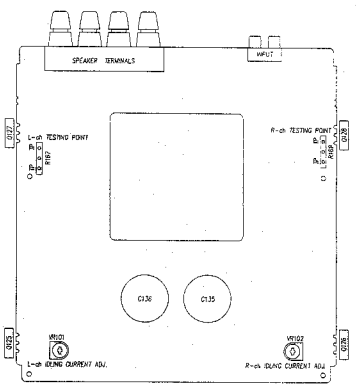
Amplifier : A500

Conditions:
- Set the Volume control of Tuner to minimum.
- Set the Speaker switches to "off" position.
- Make the adjustment at a room temperature of 77°F (25°C).
- After the Power Switch of Tuner is pushed on, Wait for 60 minutes before measuring to be sure of the most stable operation.

⚠ NOTE:
- Power amplifier can be serviced without TUNER by shorting Points PIN No. AC2 and JUMPER WIRE No. J93
- DC OFFSET VOLTAGE should be less then 100mV after POWER ON 12sec.

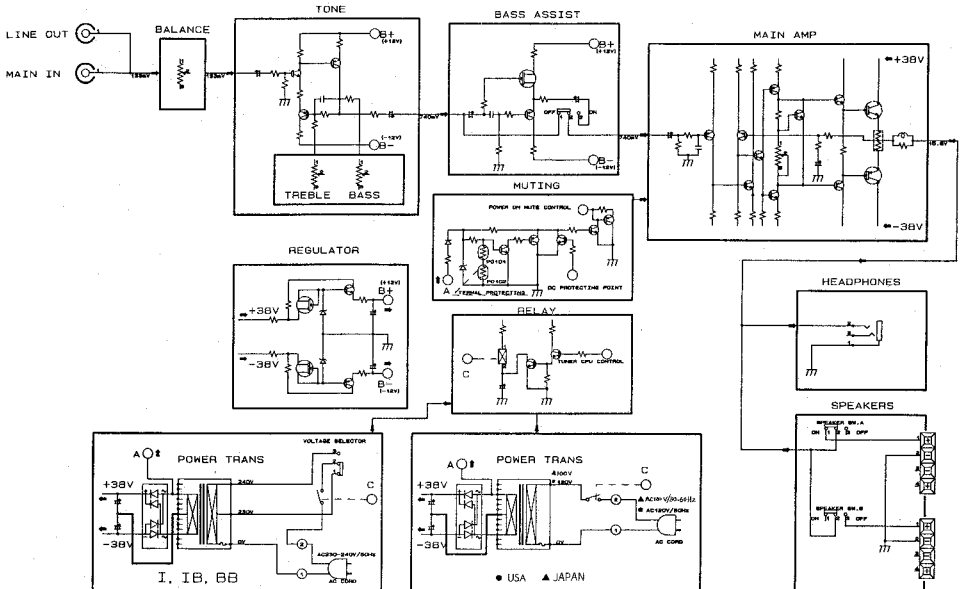
■ IDLING CURRENT ADJUSTMENT

STEP	Connection Equipments	Adjustment	FOR
1	Connect the Digital Volt Meter to both side of R167	VR101(L-ch)	26mV±2mV
2	Connect the Digital Volt Meter to both side of R168	VR102 (R-ch)	26mV±2mV



A500 Adjustment point

A-500 AMPLIFIER BLOCK DIAGRAM



Amplifier : A-500

■ TONE CONTROLS.

Fig 1 shows the basic tone control circuit. The tone amplifier is a DC-coupled amplifier

The tone circuit consistitutes INPUT small signal Transistor (Q201) OUTPUT small signal Transistor (Q205) and CONSTANT current Transistor (Q203). Tone control (Bass, Treble) is accomplished by providing the tone amplifier NFB circuit with a frequency selective characteristic. (Bass:50Hz, Treble:10kHz)

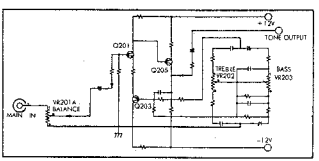


Fig. 1

■ BASS ASSIST

Fig 2 shows the BASS ASSIST circuit.

The BASS ASSIST circuit consists of CONSTANT current F. E. T (Q207) and small signal transistors (Q209, Q211).

This curcuit is active low cut filter. (Accent frequency is 55Hz).

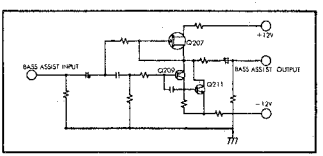


Fig. 2

■ POWER AMPLIFIER SECTION

The basic circuit arrangement of the power amplifier is shown in Fig 3. The first stage is a differential amplifier comprising PNP two transistors (Q103, 107).

The pre-drive stage consists of ultra low capacitance transistors (Q113, Q115).

The power stage bias voltage is supplied by the transistor (Q117).

The power stage consists of drive transistors (Q119, Q121) and power transistors (Q125, Q127).

The power amplifier has a over-output current protection circuit. If current exceeding the specification flows through Q125 & Q127(L-ch), Q123 & Q135 Will conduct. As result Q133 will switch OFF, and the mute line will go low(MUTE). The thermal protection circuit consists of Transistors (Q134, Q138) and posistors (PO 101, PO 102). When heat sink temperature exceeds 80℃, Q136 & Q134 switch ON and the MUTE line goes low(MUTE).

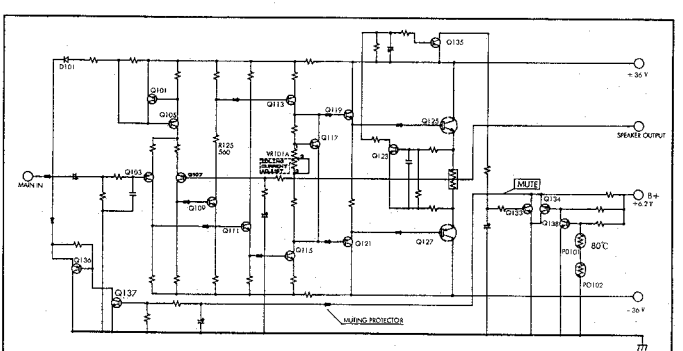
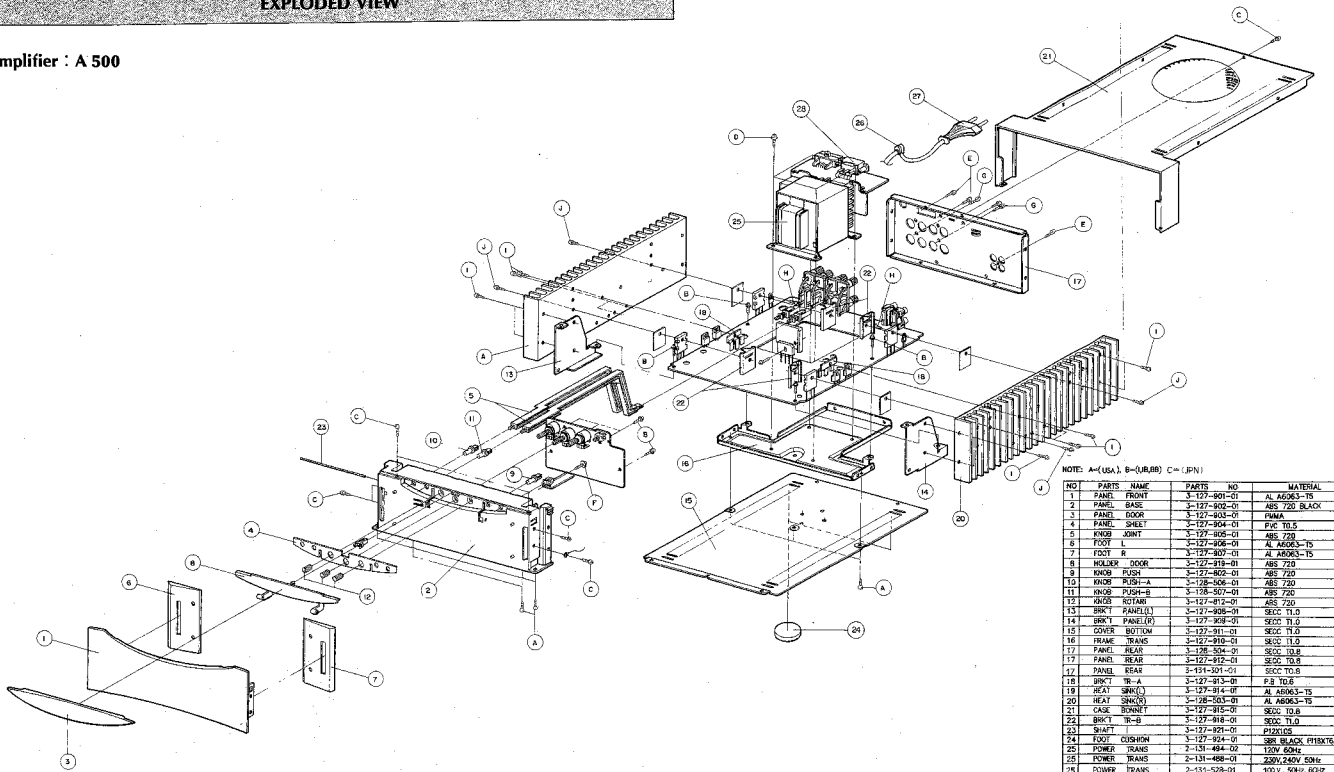


Fig. 3

EXPLODED VIEW

Amplifier : A 500



NOTE: A=(USA), B=(URUSS) C=(JPN)

NO	PARTS NAME	PARTS NO	MATERIAL	Q'TY	REMARK
1	PANEL FRONT	3-127-901-01	AL A6063-T5	1	A,B,C
2	PANEL BASE	3-127-902-01	ABS 720 BLACK	1	A,B,C
3	PANEL DOOR	3-127-903-01	PMMA	1	A,B,C
4	PANEL SHEET	3-127-904-01	PVC T0.5	1	A,B,C
5	KNOB JOINT	3-127-905-01	ABS 720	2	A,B,C
6	FOOT L	3-127-906-01	AL A6063-T5	1	A,B,C
7	FOOT R	3-127-907-01	AL A6063-T5	1	A,B,C
8	HOLDER DOOR	3-127-919-01	ABS 720	1	A,B,C
9	KNOB PUSH	3-127-802-01	ABS 720	1	A,B,C
10	KNOB PUSH-A	3-128-506-01	ABS 720	1	A,B,C
11	KNOB PUSH-B	3-128-507-01	ABS 720	1	A,B,C
12	KNOB ROTARY	3-127-812-01	ABS 720	3	A,B,C
13	BRKT PANEL(L)	3-127-908-01	SECC T1.0	1	A,B,C
14	BRKT PANEL(R)	3-127-909-01	SECC T1.0	1	A,B,C
15	COVER BOTTOM	3-127-911-01	SECC T1.0	1	A,B,C
16	FRAME TRANS	3-127-910-01	SECC T1.0	1	A,B,C
17	PANEL REAR	3-128-504-01	SECC T0.8	1	A
17	PANEL REAR	3-127-912-01	SECC T0.8	1	B
17	PANEL REAR	3-131-301-01	SECC T0.8	1	C
18	BRKT TR-A	3-127-913-01	P.B T0.6	2	A,B,C
19	HEAT SINK(L)	3-127-914-01	AL A6063-T5	1	A,B,C
20	HEAT SINK(R)	3-128-503-01	AL A6063-T5	1	A,B,C
21	CASE BONNET	3-127-915-01	SECC T0.8	1	A,B,C
22	BRKT TR-B	3-127-916-01	SECC T1.0	4	A,B,C
23	SHAFT	3-127-921-01	P12X105	1	A,B,C
24	FOOT CUSHION	3-127-924-01	SBR BLACK, Ø19X16.5	1	A,B,C
25	POWER TRANS	2-131-484-02	120V 60Hz	1	A
25	POWER TRANS	2-131-488-01	230V,240V 50Hz	1	B
25	POWER TRANS	2-131-528-01	100 V , 50Hz, 60Hz	1	C
26	BUSHING S/RELIEF	8-201-118-01	HEYCO SR-15-1	1	A
26	BUSHING S/RELIEF	8-201-117-01	HEYCO SR-14-1	1	B,C
27	CORD AC	2-211-124-02	NDG-023-0	1	A
27	CORD AC	2-211-109-02	NDG-009 VDE	1	B
27	CORD AC	2-211-136-01	125 V 7A	1	C
28	SWITCH SLIDE	2-211-124-02	NDG-023-0	1	B
A	SCREW	7-464-408-01	QBZ30P080F2K	13	A,B,C
B	SCREW	7-344-408-01	ATZ30P060F2K	8	A,B,C
C	SCREW	7-764-408-01	VBZ30P080F2K	11	A,B,C
D	SCREW	7-768-408-01	VBZ40P080F2K	4	A,B,C
E	SCREW	7-764-410-01	VBZ30P100F2K	3	A,B,C
F	SCREW	7-999-153-01	S30C	1	A,B,C
G	SCREW	7-999-166-01	PTBS0P100F2K	2	A,B,C
H	SCREW	7-999-168-01	VBZ30P060FNC	2	A,B,C
I	SCREW	7-999-169-01	VBZ30P080FNC	18	A,B,C
J	SCREW	7-999-170-01	VBZ30P120FNC+SPRING	4	A,B,C

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ELECTRICAL PARTS LIST

Amplifier A500

REF. No	Part No.	Description
	CHASSIS MISCELLANEOUS	
⚠ P1	2-211-109-02	AC LINE CORD (I, IB, BB)
	2-211-124-02	AC LINE CORD (USA)
	2-211-136-01	AC LINE CORD (JPN)
⚠ T1	2-131-488-01	POWER TRANSFORMER (I, IB, BB)
	2-131-493-01	POWER TRANSFORMER (USA)
	2-131-528-01	POWER TRANSFORMER (JPN)
⚠ FU301	2-188-625-01	FUSE T1.6A/250V (I, IB, BB)
	2-188-655-01	FUSE F3.5A/125V (USA)
	2-188-141-01	FUSE F3.5A/125V (JPN)
	PCB-1 MAIN P.C. BOARD	
	RESISTOR	
⚠ R167, 168	1-390-214-01	0.22Ω, 5W+5W
⚠ R171, 172, 173, 174	1-141-100-23	10Ω, 1W, ±5%
⚠ R401, 402	1-141-681-23	680Ω, 1W±5%
⚠ R179, 180	1-304-479-26	4.7Ω, 1/4W, ±5% FUSE
⚠ R145, 146, 151, 152	1-304-470-25	47Ω, 1/4W, ±5% FUSE
⚠ R177, 178	1-304-331-25	330Ω, 1/4W, ±5% FUSE
R184	1-118-104-25	100KΩ, 1/8W, ±5%
R188	1-114-104-25	100KΩ, 1/4W, ±5%
R111, 112	1-114-103-25	10KΩ, 1/4W, ±5%
R101, 102	1-118-102-25	1KΩ, 1/8W, ±5%
R163, 164	1-114-102-25	1KΩ, 1/4W, ±5%
R113, 116, 117, 118, 135, 136, 139, 140	1-114-152-25	1.5KΩ, 1/4W, ±5%
R147, 148, 149, 150	1-118-223-25	22KΩ, 1/8W, ±5%
R181	1-118-222-25	2.2KΩ, 1/8W, ±5%
R175, 176	1-114-220-25	22 Ω, 1/4W, ±5%
R121, 122	1-114-271-25	270 Ω, 1/4W, ±5%
R105, 106, 109, 110, 153, 154	1-118-333-25	33KΩ, 1/4W, ±5%
R190	1-114-332-25	3.3KΩ, 1/8W, ±5%
R107, 108, 159, 160	1-114-331-25	330 Ω, 1/4W, ±5%
R141, 142	1-114-391-25	390 Ω, 1/4W, ±5%
R193	1-118-392-25	3.9KΩ, 1/8W, ±5%
R191	1-114-392-25	3.9KΩ, 1/4W, ±5%
R186, 187	1-118-472-25	4.7KΩ, 1/8W, ±5%
R157, 158, 189	1-114-472-25	4.7KΩ, 1/4W, ±5%
R113, 114, 119, 120, 192	1-114-471-25	470 Ω, 1/4W, ±5%
R182	1-118-473-25	47KΩ, 1/8W, ±5%
R123, 124, 125, 126, 127, 128, 129, 130, 133, 134	1-114-561-25	560Ω, 1/4W, ±5%
R137, 138, 143, 144	1-114-560-25	56Ω, 1/4W, ±5%
R183, 185	1-118-683-25	68KΩ, 1/8W, ±5%
R155, 156	1-118-820-25	82 Ω, 1/8W, ±5%
R161, 162	1-114-911-25	910 Ω, 1/4W, ±5%
	CONTROLS	
VR101, 102	2-512-471-01	470Ω
	CAPACITOR	
C146, 147	1-416-010-65	1μF, ±20%, 50V, ELEC
C119, 120	1-413-100-65	10μF, ±20%, 16V, ELEC
C144, 145	1-416-100-65	10μF, ±20%, 50V, ELEC
C148	1-412-101-65	100μF, ±20%, 10V, ELEC
C129, 130, 131, 132	1-414-221-65	220μF, ±20%, 25V, ELEC
C105, 106	1-413-470-65	47μF, ±20%, 16V, ELEC
C123, 124	1-414-479-65	4.7μF, ±20%, 25V, ELEC
C113, 114, 115, 116, 133, 134	1-416-470-65	47μF, ±20%, 50V, ELEC
C111, 112	1-411-471-65	470μF, ±20%, 6.3V, ELEC
⚠ C135, 136	1-991-129-01-1	8200uF, ±20%, 63V, ELEC
⚠ C143	1-998-104-01-1	10000PF, ±5%, 250V (I, IB, BB)
	1-998-101-07	10000PF, ±5%, 250V (USA)
C121, 122	1-599-101-45	100PF, ±5%, 100V (I, IB, BB)
	1-886-101-45	100pF, ±5%, 50V (USA)
C709, 710	1-756-104-95	100000pF, +80%, -20%, 50V
C701, 702, 705, 706, 707, 708, 721, 722	1-599-151-45	150PF, ±5%, 100V (I, IB, BB)
C117, 118	1-806-020-15	2pF, ±5%, 50V
C107, 108	1-599-680-45	680PF, ±5%, 100V (I, IB, BB)
	1-886-680-45	68pF, ±5%, 50V (USA)
C125, 126	1-506-682-45	68000pF, 5% 50V
C127, 128	1-506-473-45	47000pf, 5% 50V

REF. No	Part No.	Description
	TRANSISTORS	
⚠ Q125, 126	2-402-167-11-1	2SC3280
⚠ Q127, 128	2-400-148-11-1	2SA1301
Q115, 116	2-402-116-41-1	2SC3787S
Q113, 114	2-400-117-41-1	2SA1477S
Q119, 120	2-402-173-21	KTC4370Y
Q121, 122	2-400-151-21	KTA1659Y
⚠ Q129	2-403-106-21	KTD1351Y
⚠ Q130	2-401-103-21	KTB988Y
Q117, 118, 133, 138	2-402-111-35	KTC3198GR
Q101, 102, 105, 106, 134	2-400-118-35	KTC1266GR
Q109, 110, 111, 112, 123, 124, 137	2-400-118-25	KTC3200BL
Q103, 104, 107, 108, 135, 136	2-400-114-25	KTA1268BL
	F.E.T	
Q131, 132	2-404-118-15-1	2SK373
	DIODES	
⚠ D107	2-413-621-61-1	PBU603
⚠ D106	2-413-581-65-1	IN4003I
D101, 102	2-410-179-95	1SS133
⚠ D103, 104	2-421-130-35	ZENER, IN964, 13V
⚠ D105	2-421-062-45	ZENER, IN753, 6.2V
	COILS	
L101, 102	2-129-305-01	0.7μH
	MISCELLANEOUS	
PO101, 102	2-505-121-01-1	POSISTOR
S101, 102	2-202-373-01	PUSH SWITCH
SPEAKER TERMINAL	2-155-776-01	10P SCREW TYPE
INPUT JACK	2-155-618-01	4P PIN JACK GOLD
WA105	2-168-134-01	WAFER 2P
WA103, 104	2-168-122-01	WAFER 3P
WA101, 102	2-168-123-01	WAFER 4P
LUG	2-899-607-01	EARTH WIRE
	PCB-2 CONTROL P.C. BOARD	
	CONTROLS	
VR201	2-501-220-21	250KΩ, MN
VR202, 203	2-501-219-01	100KΩ, 20C
	RESISTORS	
R251, 252	1-118-104-25	100KΩ, 1/8W, ±5%
R237, 238	1-118-103-25	10KΩ, 1/8W, ±5%
R217, 218, 221, 222	1-114-102-25	1KΩ, 1/4W, ±5%
R219, 220, 243, 244	1-118-101-25	100 Ω, 1/8W, ±5%
R201, 202	1-118-122-25	1.2KΩ, 1/8W, ±5%
R215, 216, 207, 208	1-118-154-25	150KΩ, 1/8W, ±5%
R209, 210	1-118-153-25	15KΩ, 1/8W, ±5%
R239, 240	1-118-224-25	220KΩ, 1/8W, ±5%
R231, 232	1-118-222-25	2.2KΩ, 1/8W, ±5%
R229, 230	1-118-221-25	220 Ω, 1/8W, ±5%
R223, 224	1-118-274-25	270KΩ, 1/8W, ±5%
R211, 212	1-118-302-25	3KΩ, 1/8W, ±5%
R213, 214, 225, 226, 253, 254	1-118-331-25	330Ω, 1/8W, ±5%
R233, 234	1-118-330-25	33 Ω, 1/8W, ±5%
R205, 206, 235, 236	1-118-473-25	47KΩ, 1/8W, ±5%
R247, 248, 249, 250	1-118-479-25	4.7 Ω, 1/4W, ±5%
R245, 246	1-118-561-25	560 Ω, 1/8W, ±5%
R227, 228	1-118-820-25	82 Ω, 1/8W, ±5%
	CAPACITORS	
C219, 220	1-416-108-65	0.1μF, ±20%, 50V ELEC
C205, 206	1-416-229-65	2.2uF, ±20%, 50V ELEC

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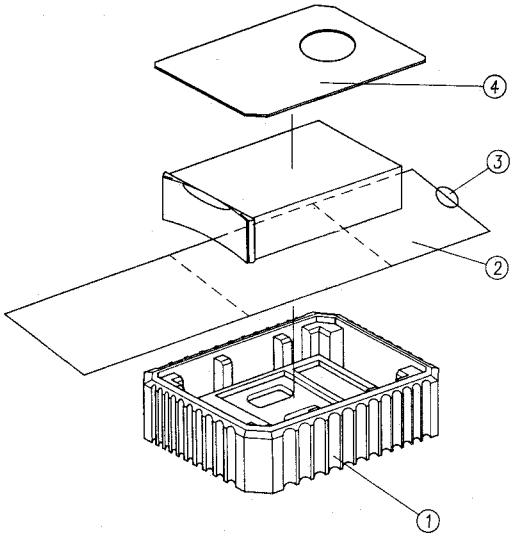
REF. No	Part No.	Description
C211, 212, 213, 214	1-413-220-65	22μF, ±20%, 16V ELEC
C225, 226	1-416-478-65	0.47μF, ±20%, 50V ELEC
C217, 218	1-413-470-65	47μF, ±20%, 16V ELEC
C209, 210	1-506-154-41	150000pF, ±5%, 50V
C207, 208	1-506-363-45	36000pF, ±5%, 50V
C201, 202	1-506-303-45	30000pF, ±5%, 50V
C223, 224	1-506-473-46	47000pF, ±5%, 50V
C203, 204	1-506-562-45	5600pF, ±5%, 50V
C215, 216	1-886-330-45	33pF, ±5%, 50V
C231, 232	1-886-100-45	10pF, ±5%, 50V
	TRANSISTORS	
Q201, Q202	2-402-111-35	KTC3198GR
Q203, 204, 205, 206	2-400-118-35	KTA1266GR
Q211, 212	2-402-118-25	KTC3200BL
Q209, 210	2-400-114-25	KTC1268BL
	F.E.T	
Q207, 208	2-404-111-35-1	2SK246GR
	MISCELLANEOUS	
S201	2-202-198-01	PUSH SWITCH
CW103	2-159-869-02	CONNECTOR ASS'Y 3P
CW101	2-159-790-01	CONNECTOR ASS'Y 4P
CW102	2-159-892-02	CONNECTOR ASS'Y 4
	PCB-3 POWER RELAY P.C. BOARD	
	RESISTOR	
⚠ R304	1-141-100-23	10Ω, 1W
R302	1-114-103-25	10KΩ, 1/4W, ±5%
R303	1-118-152-25	1.5KΩ, 1/8W, ±5%
R301	1-118-472-25	4.7KΩ, 1/8W, ±5%
	CAPACITOR	
C301	1-416-010-65	1μF, 20%, 50V, ELEC
⚠ C302	1-998-104-01-1	10000PF, ±5%, 250V (I. IB. BB)
	1-998-101-07	10000PF, ±5%, 250V (USA)
	TRANSISTORS	
Q301, 302	2-402-111-35	KTC3198GR
	DIODE	
D301	2-410-179-95	1SS133
	RELAY	
⚠ RY301	2-140-225-02-1	JW1AFSN-DC12V
	MISCELLANEOUS	
⚠ S301	2-190-179-01	SLIDE SWITCH (UB.BB)
CW105	2-159-982-01	CONNECTOR ASS'Y 3P
	PCB-4 HEADPHONES P.C. BOARD	
PHONES JACK	2-155-650-01	3P MINI JACK
CW104	2-159-643-01	CONNECTOR ASS'Y 3P

PACKING DRAWING

Amplifier : A-500

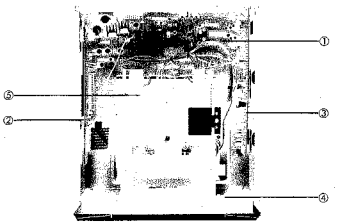


NO	PARTS NAME	PARTS NO.	Q'TY
1	PAD BOTTOM	3-127-916-01	1
2	SHEET POLY	3-324-029-01	1
3	STICKER SET	3-819-817-01	1
4	INNER LID	3-324-019-01	1

5 HK-C300

INTERNAL VIEW

■ TOP VIEW



① PCB-1 Main p.c.board
② PCB-2 Main p.c.board
③ PCB-3 Main P.c.board
④ PCB-4 Control p.c.board
⑤ Deck Mechanism

DISASSEMBLY PROCEDURES

1 TOP Cover Removal

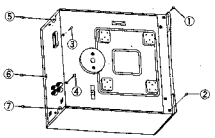


Fig. 1

1. Remove screws ① to ⑦ in Fig. 1
2. Remove the top cover

2 Rear Panel Removal

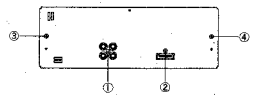


Fig. 2

1. Remove screws ① to ④ in Fig. 2, and then remove the rear panel.

3 PCB-⑮,⑯,⑰ (Main PCB) Removal

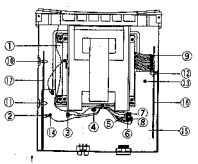


Fig. 3

1. Remove the rear panel in Fig. 2 (Refer to step 2)
2. Remove connectors ① to ⑨, and then remove pcb supports ⑩ to ⑫ in Fig. 3
3. Remove screws ⑬ to ⑮, and then remove the pcb-1 ⑯, pcb-2 ⑰ and pcb-3 ⑱

4 Front Panel Assembly Removal

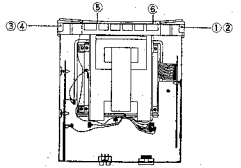


Fig. 4

1. Remove screws ① to ⑥ in Fig. 4
2. Remove the front panel assembly by pulling it toward you gently

5 PCB-⑤(Control PCB)Removal.

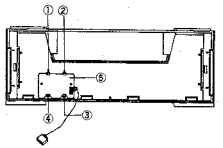


Fig · 5

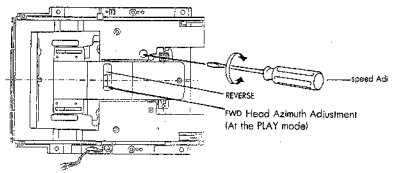
1. Remove the front panel assembly (Refer to step 4)
2. Pulling hooks ① to ④ in Fig · 5, and then remove the control pcb ⑤

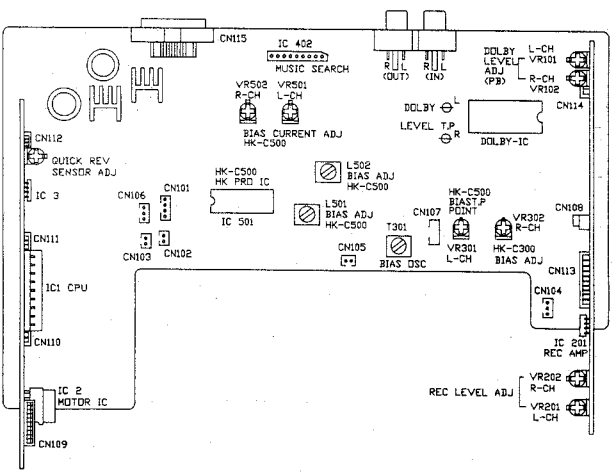
Tape Deck : C300/C500

STEP	Alignment	Instrument Required	Input Signal	Mode	Test point	Adjustment	FOR
1	Azimuth	VTVM Oscilloscope Test tape (MTT-114 or TCC-154)		PB	OUTPUT jack	Azimuth screw	Maximum output Refer to "Azimuth Adjustment" on page 62
2	Tape speed	Frequency counter Test tape (MTT-111DN or TCC-112)		PB	OUTPUT jack	VR(built-in motor)	3000Hz ± 10Hz Adjust at the center of test tape.
3	Playback output level	VTVM Test tape (TCC-130 or (MTT-150)		PB	OUTPUT jack	VR101 VR102	365mV·15mV, +40mV
4	Playback frequency characteristic confirmation	VTVM Test tape (TCC-162B and TCC-262B)		PB	OUTPUT jack	R131~ R136	Unsolder resistors of R131 and R132, R133 and R134, or R135 and R136 so that the frequsncy response is within the range as shown in page 62
5	Bias frequency confirmation	Frequency counter		REC/PB	ERASE HEAD	T301	105KHz ± 3KHz Tape selector is METAL position
6	Dolby HX PRo (HK-C500)	VTVM Blank tapes		REC/PB BIAS	HK-C500 Bias point (L),(R)	L 501 L 502	Maximum output Tape selector is METAL position
	At the HK-C500 BIAS CURRENT Adj	METAL : MX(Maxell) Bias Point(L),(R)		TRIM	OUTPUT jack	VR501 VR502	Adjust until the record/playback frequency response is flat in ± 3dB
	At the HK-C300 BIAS CURRENT Adj	VTVM Blank tapes : Metal MX		REC/PB	OUTPUT jack	VR301 VR302	Adjust until the record/playback frequency response is flat in ± 3dB
7	Record level (pre-adjustment)	VTVM Blank tapes NORMAL:AC-224(TDK) CrO2 :XL-II(MAXELL) METAL:MX(MAXELL)	Apply 1KHz signal to INPUT jack. OUTPUT voltage is 365mV in RECORDING mode.	REC / PB	OUTPUT jack	VR201 VR202	365mV Tape selector is CrO2 Position. Adjust VR201 and VR202 so that the distortion becomes 0.8% This confirmation should be done for each tape type.
8	Record/playback EQ frequency response	VTVM Blank tapes NORMAL:AC-224 CrO2:XL-II METAL:MX	Apply 1kHz signal to INPUT jack. OUTPUT voltage is 20dB below 365 mV in RECORDING mode. Them adjust with a 20Hz to 20 kHz	REC/PB	OUTPUT jack	(HK-C500) VR501 VR502 L 501 L 502 (HK-C300) VR301 VR302	Adjust until the record/playback frequency response is flat (at least within the range in ± 3dB) This confirmation should be done for each tape type. confirm with Dolby B and C NR ON and for each tape type.

MECHANICAL ADJUSTMENT

Tape Speed, Azimuth			
Mode	Test tape	Adjustment position	Specification rating(playback frequency)
PLAY	Play TCC-154 tape(12.5 kHz)	Head Azimuth Screw Adj	45 degree(fig - A)





C300/C500 : Adjustment point

■ ELECTRICAL ADJUSTMENT AND CONFIRMATION

1. Before adjustment

- After the power switch is pushed on, wait for 10 minutes before measuring to be sure of the most stable operation.
- Since head magnetization, dust accumulations etc are likely to introduce errors in the various characteristics, it is very important that the heads are properly demagnetied and cleaned before commencing any adjustment, particulaly frequency response and head azimuth adjustment.

2. Instruments required

- Low frequency oscillator
- AC VTVM or dual channel AC VTVM
- Oscilloscope
- Wow/Flutter meter
- Frequency counter

3. Test tapes

- Azimuth adjustment ····· MTT-114 or TCC-154
- Tape speed adjustment ····· MTT-111 orTCC-112
- Playback output level adjustment ····· TCC-130(200nWb)
- Playback frequency characteristic confirmation
  ····· TCC-162B and TCC-262B
- Reference tapes : Specify either C-90 or C-60.
  LN (TDK) ····· AC-224
  CrO2 -(MAXELL) ····· XL-II
  METAL (MAXELL) ····· MX

Note:
C-90 differes with C-60 in the thickness and bias.
Adjust with the tape as specified.

4. General conditions (unless otherwise noted)

Controls and Switches	Setting
Dolby NR	off

Azimuth Adjustment

When the maximum level point of R channel is not the same as L channel, connect the oscilloscope as shown in Fig A and proceed with azimuth adjustment so that L and R channels are in phase.

a) Connect L channel tape out to "X (or Hi" and R channel to "Y (or V)". Observe the lissajous waveform.

b) Set L and R channels to monaural. Adjust vertical and horizontal gain so that the waveform becomes 45degree.

c) Adjust azimuth so that the measurement of "a" becomes maximum and the measurement of "b" becomes minimum against the 45 degree Line.

d) apply lock tight to head Azimuth Screw

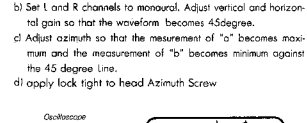
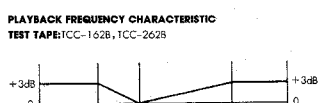
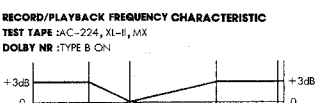


Fig. A

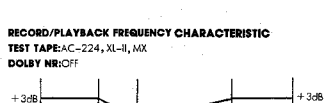
PLAYBACK FREQUENCY CHARACTERISTIC
TEST TAPE:TCC-162B, TCC-262B



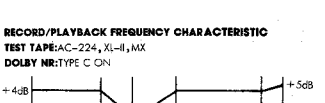
RECORD/PLAYBACK FREQUENCY CHARACTERISTIC
TEST TAPE :AC-224, XL-II, MX
DOLBY NR :TYPE B ON



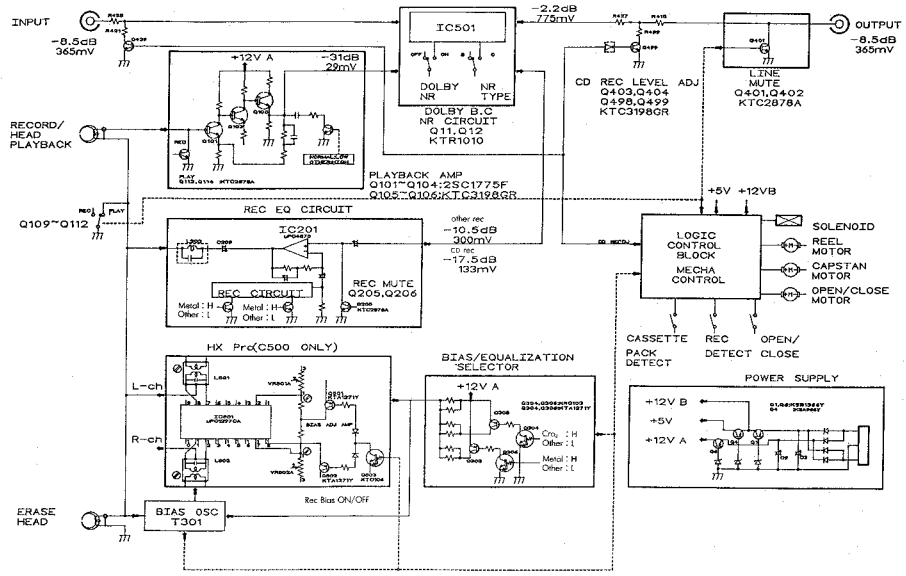
RECORD/PLAYBACK FREQUENCY CHARACTERISTIC
TEST TAPE:AC-224, XL-II, MX
DOLBY NR:OFF



RECORD/PLAYBACK FREQUENCY CHARACTERISTIC
TEST TAPE:AC-224, XL-II, MX
DOLBY NR:TYPE C ON



C-300/500 TAPE DECK BLOCK DIAGRAM



PLAYBACK SIGNAL

The signal from the playback head is amplified by the playback amplifier Q101, Q103 and Q105 (L-ch), and is applied to the pins 3(L-ch) and 28 (R-ch) of the Dolby NR IC401 (B/C type). Switching of the playback signal from the record mode (external input signal) to the playback mode is performed inside IC401.

IC401 is usually switched to the playback mode. However, the control signal transmitted to the pin 26 of IC401 from IC1 through Q13 switches IC401 from the record mode to the play mode. The input signal to IC401 is output from the pins 9(L-ch)and 22(R-ch) and applied to the OUTPUT jack. The characteristics of the playback equalizer are defined by the BIAS/EQUALIZATION switch and are selected and specified in Q119(L-ch) and Q120(R-ch)

RECORD SIGNAL

The signal from the INPUT jack is controlled by the Q429(CD REC level Adj) and is applied to pins 1(L-ch)and 30(R-ch) of the Dolby NR IC401 (B/C type). Switching of the record signal from the playback mode to the record mode is performed inside IC401. The control signal transmitted to the pin26 of IC401 from IC1 through Q13 switches IC401 from the playback mode to the record mode.

The input signal to the Dolby IC is output from pin 15(L-ch) and pin16(R-ch). The signal output from IC401 passes through the record equalizer circuit and is amplified by the record amplifier of IC201. The amplified signal is then applied to the recording head after being synthesized by a bias signal.

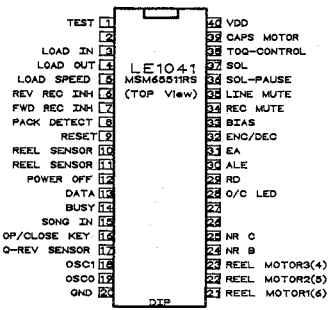
MUTING OPERATION

The signal that mutes the sound produced at switching to recording or playback is applied from IC1 of the logic control block.

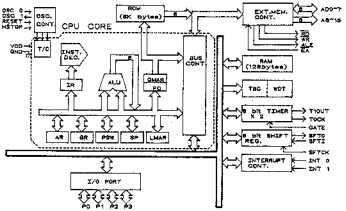
When the "MUTE"button is pressed, the signal output from the pin35 of IC1 turns ON Q401(L-ch) and Q402 (R-ch) to short-circuit the output signals of the playback amplifiers for muting.

IC FUNCTIONAL BLOCK DIAGRAM

IC1 : MICRO COMPUTER



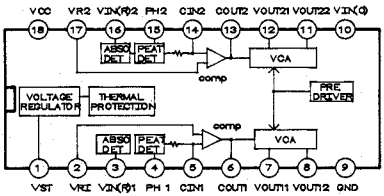
IC1 : CPU CONTROL LE-1041



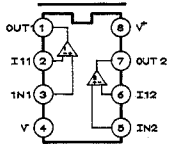
PIN No.	Port name	Function name	I/O	Outline of Functions
3	P3.2	LOAD IN SW	I	LOADING CLOSE = LOW
4	P3.3	LOAD OUT SW	I	LOADING OPEN = HIGH
5	P3.4	LOAD SPEED CONT SW	I	CLOSE PACK SLIDE DOWN = LOW
6	P3.5/SFTO	REV REC INH	I	REV RECORDING INHIBIT TERMINAL
7	P3.6/SFTI	FWD REC INH	I	FWD //
8	P3.7	PACK DETECT	I	TAPE DETECTOR INPUT TERMINAL
9	RESET	RESET		SYSTEM RESET TERMINAL.
10	P2.0	REEL SENSOR	I	SENSING PULSE INPUT TERMINAL .
11	P2.1	REEL SENSOR	I	
12	P2.2/INIT0	POWER OFF	I	POWER ON/OFF DETECTION TERMINAL . LOW LEVEL-OFF
13	P2.3/INIT1	DATA	I/O	SYSTEM CONTROL SIGNAL I/O TERMINAL
14	P2.4	BUSY	I/O	
15	P2.5	SONG INPUT	I	INPUT TERMINAL FOR SONG INTERVAL DETECTION.
16	P2.6/WR	OP/CLOSE KEY	I	DOOR OPEN/CLOSE TOGGLE KEY INPUT . LOW ACTIVE
17	P2.7	Q-REV SENSOR	I	TAPE END/START POINT DETECTION
18	OSC1	OSC2		4MHz RESONATOR CONNECTING TERMINAL.
19	OSC0	OSC1		
20	GND	GND		GND TERMINAL.
21	P1.0/A8	REEL MOTOR(6)	O	BA6238A 4PIN CPU 20PIN / BA6238A 5PIN CPU 22PIN / BA6238A 6PIN CPU 21PIN
22	P1.1/A9	REEL MOTOR(5)	O	
23	P1.2/A10	REEL MOTOR(4)	O	
24	P1.3/A11	NR (DOLBY)	I	DOLBY FUNCTION CONTROL.
25	P1.4/A12	NR (DOLBY)	I	
26	P1.7/A15	O/C LED	O	LOW ACTIVE
32	P0.7/AD7	ENC/DEC	O	PLAY = HIGH REC = LOW
33	P0.6/AD6	BAIS	O	REC = HIGH
34	P0.5/AD5	REC MUTE	O	REC MUTE-LOW
35	P0.4/AD4	LINE MUTE	O	LINE MUTE = HIGH
36	P0.3/AD3	SOL PAUSE	O	LOW VOLTAGE OUTPUT TERMINAL FOR SOLENOID DRIVE.
37	P0.2/AD2	SOLENOID	O	SOLENOID ACTIVE = HIGH
38	P0.1/AD1	TOQ-CONTROL	O	POWER CONTROL HIGH LEVEL = POWER DOWN.
39	P0.0/AD0	CAPSTAN MOTOR	O	OUTPUT TERMINAL FOR CAPSTAN MOTOR DRIVE.
40	VDD	VDD		+5 (POWER SUPPLY TERMINAL)

PIN	NO	F.F	R.P	FF	REW	STOP	OPEN	CLOSE
4	L	H	L	H	L	L	L	L
5	L	L	L	L	L	L	H	H
6	H	H	H	H	H	L	H	L

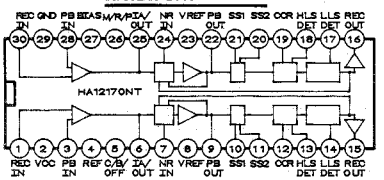
IC501 : HX PRO
UPC1297CA



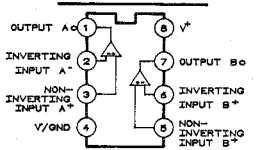
IC201 : REC EQ
UPC 4570



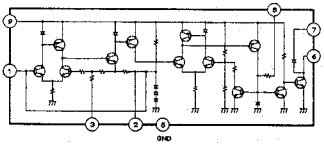
IC401 : DOLBY B.C NR
HA1217ONT


REC GND PB BIAS M/R/P IN/ OUT NR IN VREF PB OUT SS1 SS2 CCR H.LS DET L.LS DET REC OUT
30 29 28 27 26 25 24 23 22 21 20 19 18 17 16
HA1217ONT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
REC IN VCC PB IN REF OFF O/P IN/ OUT NR IN VREF PB OUT SS1 SS2 CCR H.LS DET L.LS DET REC OUT

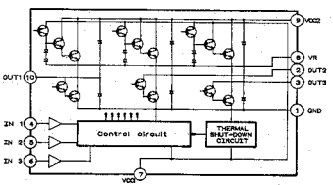
IC3 : Q-REV SENSOR
BA10393



IC402 : MUSIC SEARCH
LA 2000

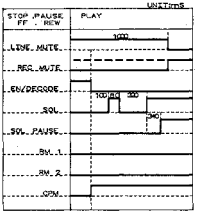


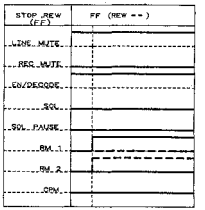
IC2 : MOTOR DRIVER BA6238A

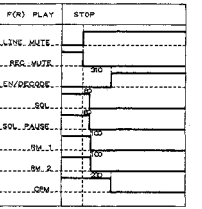


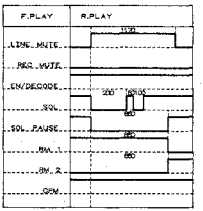
TIMING CHART

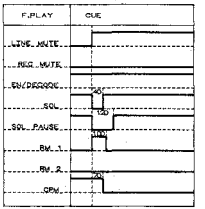
Tape Deck : C300/500

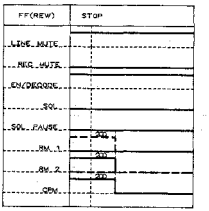


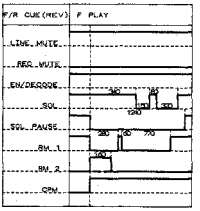


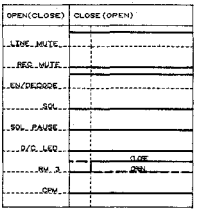












TAPE DECK MECHANISM EXPLODE VIEW

PARTS TABLE

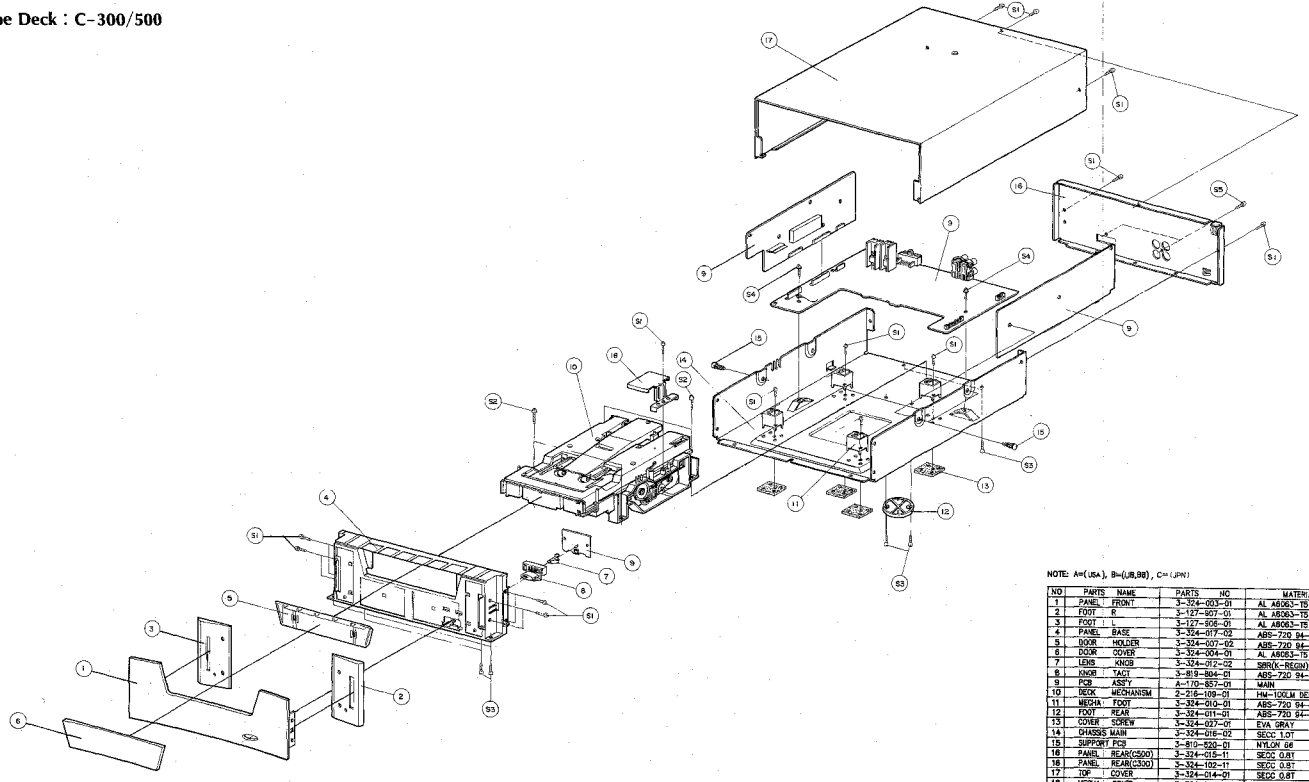
NO.	PARTS NO.	NAME	Q.TY
2	F511-545	CHASSIS BLK	1
2- 1	F517-049	IDLER BLK	1
2- 2	F584-280	MTR REEL BLK	1
2- 3	F612-141	CHASSIS BASE BLK	1
2- 4	F623-027	REEL BASE BLK	2
2- 5	FE158-11A	SCREW 2.6×6.4	2
2- 6	FJ313-17	WASHER 3.7×6.25	2
2-11	FJ129-11	WASHER 2.1×6.25	2
ADJ- 3	F513	PLATE NO BLK	1
3- 5	FE528-37	HEAD BASE	1
3- 9	FE106-14	HD SP	1
3-10	F8179-12	HARDASS298	1
3-11	FE158-11	SCREW TT 2.6×5	2
3-12	H9575-01	WIRE COMPLETE E	1
3-15	H9574-03	WIRE CONNECTOR F/M	1
4	F526-209	MTR MAIN BLK	1
4- 3	FE539-21	MTR BKT	1
4- 4	FE129-12	SCREW 2.6×7.5 IH	3
4- 5	FJ135-12	MTR CUSHION	3
4- 7	F3460-14	MTR PULLEY	1
4- 8	FE168-31	NUT-HEXNE	1
5	F567-524	PCB CONTROL BLK	1
5-11	WE459-040	JUMPER LINES	1
5-12	WE459-020	JUMPER LINES	1
5-13	AH13K-00	SPI-335-21	2
5-14	WE07- 3	3 LEAD JUMPER LINES	1
5-15	WE55E-03	BRIDGE JUMPER LINES	1
5-17	QE106-11	PUSH SWITCH	5
6	FE528-16	PLATE SLIDE	1
10	FA456-15	HOLDER LEAD	1
12	FA456-21	ARM PLAYING	1
14	FA453-16	CAM GEAR(SB)	1
15	FB441-14	LEVER REC	1
16	FB441-11	LEVER PLAY(P)	1
17	FB449-12	LEVER METAL(S)	1
18	FF170- 31	BELT MAIN	1
20	FJ111-30	WASHER 2.6×0.25	2
26	FE248-11	SP. SLIDE	1
29	FE228-11	ASSY F/W	1
30	FE52E-13	ASSY F/W	1

NO.	PARTS NO.	NAME	Q.TY
31	FE20L-218	PINCH ROLLER(C)	1
32	FE20M-41	PINCH ROLLER(L)	1
49	QE106-18	SCREW 3.0×9 IH	1
51	F705-283	SOLENOID BLK	1
52	FL194-124	IRON CORE	1
53	FL19K-127	PLUNGER	1
61	F573-200	PLATE HOLD BLK	1
61-1	FE539-21	F/W BKT	1
61-2	FJ111-18	WASHER 2.1×5.25	2
61-3	FJ113-34	WASHER 1.7×9.25	1
61-5	FE22E-12	RUBBER PULLEY	1
61-7	QA13L-11	SPACER SPACER	2
63	QE106-28	SCREW 2.6×4	2
64	QE12H-14	WAVE SCREW2.6×8	2
65	FF184-13	MAIN BELT	1
70	QE10D-11	SCREW M2.6×25	1
71	FE126-21	BAND FOR WASH	1
ADJ-1	AE12P-00	SPI - 330 PC	1
ADJ-2-1	WH454-04	WIRE CONNECTOR(6P)	1
ADJ-2-2	AE12E-03	REFLECTOR, OPTICAL	1

(A) : MOLYKOTE X5
(B) : SCREW LOCK
(A1) (C) : DIA BOND ONG3

EXPLODED VIEW

Tape Deck : C-300/500



NOTE: A=(USA), B=(UB,BB), C=(JPN)

NO	PARTS NAME	PARTS NO	MATERIAL	QTY	REMARK
1	PANEL FRONT	3-324-003-01	AL A6063-T5	1	A,B
2	FOOT R	3-127-907-01	AL A6063-T5	1	A,B,C
3	FOOT L	3-127-906-01	AL A6063-T5	1	A,B,C
4	PANEL BASE	3-324-017-02	ABS-720 94-HB	1	A,B
5	DOOR HOLDER	3-324-007-02	ABS-720 94-HB	1	A,B,C
6	DOOR COVER	3-324-004-01	AL A6063-T5	1	A,B,C
7	LENS KNOB	3-324-012-02	SBR(K-REGIN)94-HB	1	A,B,C
8	KNOB TACT	3-819-884-01	ABS-720 94-HB	1	A,B,C
9	PCB ASS'Y	A-170-857-01	MAIN	1	A,B,C
10	DECK MECHANISM	2-216-109-01	HM-100LM DENON	1	A,B
11	MECHA FOOT	3-324-010-01	ABS-720 94-HB	4	A,B,C
12	FOOT REAR	3-324-011-01	ABS-720 94-HB	1	A,B,C
13	COVER SCREW	3-324-027-01	EVA GRAY	4	A,B,C
14	CHASSIS MAIN	3-324-016-02	SECC 1.0T	1	A,B,C
15	SUPPORT PCB	3-810-520-01	NYLON 66	3	A,B,C
16	PANEL REAR(C500)	3-324-015-11	SECC 0.8T	1	A,B,C
16	PANEL REAR(C300)	3-324-102-11	SECC 0.8T	1	A,B,C
17	TOP COVER	3-324-014-01	SECC 0.8T	1	A,B,C
18	MECHA BRKT	3-324-502-01	SECC 1.2T	1	A,B,C
S1	SCREW	7-764-408-01	VBZ30P080F2K	18	A,B,C
S2	SCREW	7-768-420-01	VBZ40P200F2K	4	A,B,C
S3	SCREW	7-464-408-01	CBZ30P080F2K	8	A,B,C
S4	SCREW	7-344-408-01	ATZ30P080F2K	2	A,B,C
S5	SCREW	7-764-410-01	VBZ30P100F2K	2	A,B,C

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Tape Deck : C-300/500

REF. No	Part No.	Description
	PCB-1 MAIN P.C. BOARD	
	INTEGRATED CIRCUITS	
IC402	2-441-313-72	LA2000 MUSIC SEARCH
IC501 (C500)	2-442-241-54-1	UPC1297CA HX Pro
IC401	2-440-929-32-1	HA12170NT DOLBY B,C
	TRANSISTORS	
Q401, 402, 498, 499	2-402-154-15	KTC2878A
⚠ Q1, 6	2-401-112-21	KTB1366Y
Q4	2-400-140-25	KTA965AY
Q303, 305 (501, 502 : C500)	2-400-108-25	KTA1271Y
Q2, 3, 5, 7, 8, 301, 302 403, 404, 405, 497	2-402-111-35	KTC3198GR
Q10, 13	2-406-111-15	KSR1010 R1=10KΩ
Q9, 18, 19, 307 (503 : C500)	2-406-127-15	KSC1066M R1=4.7KΩ R2=47KΩ
Q14, 66	2-406-126-15	KRA106M R1=4.7KΩ R2=47KΩ
Q304, 306	2-400-104-15	KRC103M
Q308	2-402-109-25	KTC1627A-Y, PA,
	DIODES	
⚠ D5, 6, 9, 12, 13, 301, 303, 304 (501, 502 : C500)	2-410-179-95	1SS133
⚠ D1, 2, 3, 4, 302	2-413-581-65-1	1N4003L
D7, 11	2-426-128-85-1	ZENER, HZ12B2LTA
D8	2-421-062-45	ZENER, 1N753A
D10	2-421-051-35	ZENER, 1N751A
	COILS	
T301(C500)	2-129-352-01	BIAS OSC, 105KHz
T301(C300)	2-129-215-01	RTF-057-0, LINE
L501, 502 (C500)	2-138-508-01	126AN-6750 HX-Pro
	CONTROLS	
VR501, 502 (C500)	2-512-103-01	10KB
VR301, 302 (C300)	2-512-104-01	100KB
	RESISTORS	
R1, 11	1-114-152-25	1.5 KΩ, 1/4W, ±5%
R2, 12	1-114-471-25	470 Ω, 1/4 W, ±5%
R3, 13, 412	1-114-101-25	100 Ω, 1/4 W, ±5%
R4	1-304-109-25	1 Ω, 1/2 W, ±5%, FUSE
R5 8, 9, 81, 82, 83, 415, 416, 89	1-118-102-25	1KΩ, 1/4 W, ±5%
R6	1-118-471-25	470Ω, 1/4W, ±5%
R7	1-118-101-25	100Ω, 1/4W, ±5%
R10, 22, 23, 318, 313 (508 : C500)	1-118-103-25	10KΩ, 1/4W, ±5%
R14	1-114-279-25	2.7Ω, 1/4W, ±5%
R86	1-118-470-25	47Ω, 1/4W, ±5%
⚠ R302, 303	1-118-479-25	4.7Ω, 1/4W, ±5%
R304, 305, 320	1-118-332-25	3.3KΩ, 1/4W, ±5%
R306	1-114-391-25	390Ω, 1/4W, ±5%
R307	1-114-471-25	470Ω, 1/4W, ±5%
R308, 309	1-114-621-25	620Ω, 1/4W, ±5%
R310, 311	1-114-390-25	39Ω, 1/4W, ±5%
R312, 316, 319, 398, 399, 405, 406, 409, 410 494 (503, 504, 510 : C500)	1-118-223-25	22KΩ, 1/4W, ±5%
R314, 315	1-118-682-25	6.8Ω, 1/4W, ±5%
R403, 404	1-118-562-25	5.6KΩ, 1/4W, ±5%
R407, 408	1-118-561-25	560Ω, 1/4W, ±5%
R411	1-118-183-25	18KΩ, 1/4W, ±5%
R417, 418	1-118-222-25	2.2KΩ, 1/4W, ±5%
R419, 420	1-118-822-25	8.2KΩ, 1/4W, ±5%
R421, 422	1-118-302-25	3KΩ, 1/4W, ±5%
R423, 424, 429, 430, 495, 496, 497 (507, 509 : C500)	1-118-472-25	4.7KΩ, 1/4, ±5%
R425, 426	1-118-333-25	33KΩ, 1/4, ±5%
R427, 428	1-118-182-25	1.8KΩ, 1/4, ±5%
R431	1-118-564-25	560KΩ, 1/4, ±5%
R432	1-118-681-25	680Ω, 1/4, ±5%
R433	1-118-181-25	180Ω, 1/4, ±5%
R434	1-118-821-25	820Ω, 1/4, ±5%
R498, 499	1-118-362-25	3.6KΩ, 1/4, ±5%
R501, 502 (C500)	1-118-184-25	180KΩ, 1/4, ±5%
R505, 506 (C500)	1-118-153-25	15KΩ, 1/4, ±5%

REF. No	Part No.	Description
	MISCELLANEOUS	
SW999	2-208-999-01	KHH-10910 TACT SW
CN101	2-168-123-01	NKC-023-0, 4P
CN106, 107	2-168-179-01	B3B-XH, JST
CN102, 103, 104, 105	2-168-252-01	FRN1039-A, JST
CN115	2-168-469-01	S2303-1311, 13P
JP102	2-155-618-01	RCA JACK, GOLD, WHITE, RED, 4P
HEA101, 102	3-710-702-03	40MM, AL, HEAT SINK
	CAPACITORS	
C1, 2, 436	1-756-473-95	47000pF, ±20%, 50V
△ C3	1-414-472-67	4700μF, ±20%, 25V, ELEC
C4, 10	1-413-471-67	470μF, ±20%, 16V, ELEC
C5, 11	1-413-102-67	1000μF, ±20%, 16V, ELEC
C7	1-412-471-65	470μF, ±20%, 10V, ELEC
C8 (515 : C500)	1-416-100-65	10μF, ±20%, 50V, ELEC
C9	1-414-222-67	2200μF, ±20%, 25V, ELEC
C12, 516	1-416-479-65	4.7μF, ±20%, 50V, ELEC
C13, 401, 402, 413, 414, 418	1-416-010-65	1μF, ±20%, 50V, ELEC
C301	1-506-822-45	0.0082μF, ±5%, 400V
C302	1-506-103-45	0.01μF, ±5%, 50V
C303, 304	1-506-332-45	0.0033μF, ±5%, 50V
C305, 403, 404, 405, 406, 407, 408	1-506-222-45	0.0022μF, ±5%, 50V
C306	1-414-220-65	22μF, ±20%, 25V, ELEC
C409, 410, 411, 412, 422, 423, 434, 435 514, 517	1-416-108-65	0.1μF, ±20%, 50V, ELEC
C415, 416	1-416-229-65	2.2μF, ±20%, 50V, ELEC
C420, 421	1-413-100-65	10μF, ±20%, 16V, ELEC
C419, 437	1-413-220-65	22μF, ±20%, 16V, ELEC
C431, 432	1-888-181-45	180pF, ±5%, 50V
C433	1-416-478-65	0.47μF, ±20%, 50V, ELEC
C501, 502 (C500)	1-886-391-45	390pF, ±5%, 50V
C503, 504 (C500)	1-88F-181-55	180pF, ±5%, 500V
C505, 506 (C500)	1-506-473-45	0.047μF, ±5%, 50V
C507, 508 (C500)	1-506-223-45	0.022μF, ±5%, 50V
C509, 510 (C500)	1-886-103-45	10000pF, ±5%, 50V
C511, 512 (C500)	1-886-821-45	820pF, ±5%, 50V
C513 (C500)	1-88F-101-45	100pF, ±5%, 500V
C999	1-756-103-95	10000pF, ±20%, 50V
	PCB-2 SUB P.C. BOARD	
	INTEGRATED CIRCUITS	
IC201	2-442-205-41	UPC4570C
	TRANSISTORS	
Q101, 102, 103, 104	2-402-179-65-1	2SC1775FTZ
Q113, 114, 205, 206	2-402-154-15	KTC2878A, RF/SW
Q109, 110, 111, 112	2-402-118-15	KTC3200GR
Q105, 106, 115	2-402-111-35	KTC3198GR
Q12, 13, 20, 21	2-406-111-15	KSR1010, R1=10KΩ
Q116, 119, 120, 121, 201, 202	2-406-127-15	KRC106M R1=4.7KΩ R2=47KΩ
Q117	2-406-126-15	KRA106M R1=4.7KΩ R2=47KΩ
Q118	2-400-114-25	KTA1268BL
Q203, 204	2-406-104-15	KRC103M
	DIODES	
D101, 103, 201, 202	2-410-179-95	1SS133, TP
D102	2-426-105-85-1	ZENER, HZ11B2LTA
	COILS	
L101, 102	2-129-387-01	22mH, ±10%, CHOKE
L201, 202	1-011-472-21	NTH-030-0, 4.7mH, ±5%
L203, 204	2-129-261-01	NTH-061-0, BIAS TRAP
	CONTROLS	
VR101, 102, 201, 202	2-514-203-01-1	20KB, EVNDCAA05B24

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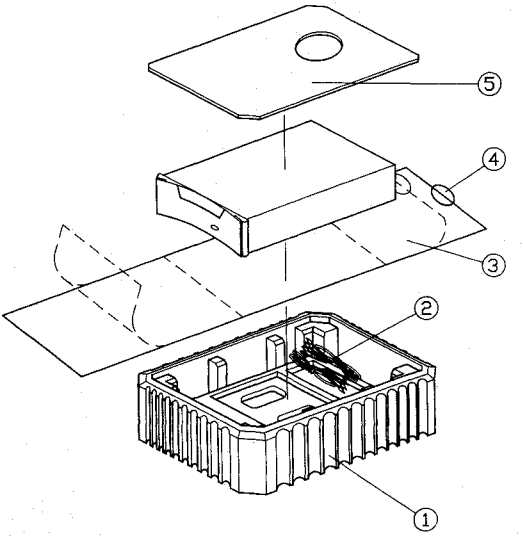
REF. No	Part No.	Description
	RESISTORS	
R27	1-114-101-25	100Ω, 1/4W, ±5%
R117, 118	1-118-102-25	1KΩ, 1/4W, ±5%
R101, 102	1-118-101-25	100Ω, 1/4W, ±5%
R103, 104	1-118-223-25	22KΩ, 1/4W, ±5%
R105, 106	1-118-331-25	330Ω, 1/4W, ±5%
R107, 108, 203, 204,	1-118-562-25	5.6KΩ, 1/4W, ±5%
R109, 110	1-118-470-25	47Ω, 1/4W, ±5%
R137, 138, 139, 140, 143, 144, 150, 151	1-118-103-25	10KΩ, 1/4W, ±5%
152, 219, 220, 221, 222, 215, 216		
R145, 146, 207, 208	1-118-223-25	22KΩ, 1/4, ±5%
R111, 112	1-118-224-25	220KΩ, 1/4, ±5%
R113, 114	1-118-681-25	680Ω, 1/4, ±5%
R119, 120	1-118-362-25	3.6KΩ, 1/4, ±5%
R227, 228	1-118-332-25	3.3KΩ, 1/4, ±5%
R121, 122	1-118-684-25	680KΩ, 1/4, ±5%
R123, 124	1-118-912-25	9.1KΩ, 1/4, ±5%
R125, 126	1-118-821-25	820Ω, 1/4, ±5%
R127, 128, 141, 142	1-118-392-25	3.9KΩ, 1/4, ±5%
R131, 132	1-118-242-25	2.4KΩ, 1/4, ±5%
R147	1-114-479-25	4.7Ω, 1/4, ±5%
R148	1-114-102-25	1KΩ, 1/4, ±5%
R149	1-118-222-25	2.2KΩ, 1/4, ±5%
R205, 206	1-118-472-25	4.7KΩ, 1/4, ±5%
R209, 210	1-118-333-25	33KΩ, 1/4, ±5%
R211, 212 (C300)	1-118-151-25	150Ω, 1/4, ±5%
R211, 212 (C500)	1-118-181-25	180Ω, 1/4, ±5%
R213, 214 (217, 218 : C500)	1-118-152-25	1.5KΩ, 1/4, ±5%
R129, 130	1-118-105-25	1MΩ, 1/4, ±5%
R115, 116	1-118-331-25	330Ω, 1/4, ±5%
R201, 202, 225, 226	1-118-682-25	6.8KΩ, 1/4, ±5%
R223, 224	1-118-823-25	82KΩ, 1/4, ±5%
R217, 218(C300)	1-118-242-25	2.4KΩ, 1/8, ±5%
	CAPACITORS	
C101, 102	1-880-331-45	330pF, ±5%, 50V
C103, 104	1-414-479-65	4.7μF, ±20%, 25V, ELEC
C107, 108, 201, 202	1-506-622-45	0.0062μF, ±5%, 50V
C109, 110	1-506-682-45	0.0068μF, ±5%, 50V
C111, 112, 116	1-413-100-65	10μF, ±20%, 16V, ELEC
C113, 114	1-506-122-45	0.0012μF, ±5%, 50V
C117	1-413-330-65	33μF, ±20%, 16V, ELEC
C115	1-413-471-67	470μF, ±20%, 16V, ELEC
C203, 204	1-416-010-65	1μF, ±20%, 50V, ELEC
C205, 206	1-416-100-65	10μF, ±20%, 50V, ELEC
C207, 208	1-416-158-65	0.15μF, ±20%, 50V, ELEC
C209, 210	1-416-479-65	4.7μF, ±20%, 50V, ELEC
C211, 212	1-506-123-45	0.012μF, ±5%, 50V
C219, 220	1-506-222-45	0.0022μF, ±5%, 50V
C213, 214	1-506-203-45	0.02μF, ±5%, 50V
C255, 266	1-506-103-45	0.01μF, ±5%, 50V
C257, 258	1-506-752-45	0.0075μF, ±5%, 50V
C315, 216	1-506-183-45	0.018μF, ±5%, 50V
	MISCELLANEOUS	
CN108	2-168-454-01	B6B-XH-A JST
CN110	2-168-385-01-1	53178-1110, 11P,
CN112, 114	2-168-382-01-1	53178-0510, 5P
CN111, 113	2-168-387-01-1	53178-1510, 15P
	PCB-3 SUB P.C. BOARD	
	RESISTORS	
R21	1-118-181-25	180Ω, 1/4, ±5%, TP
	MISCELLANEOUS	
JP101	2-169-789-01	2.5MM, 4P, L=450 CONNECTOR
D999	2-419-493-45	R34MC F02, LED,

REF. No	Part No.	Description
	PCB-4 SUB P.C. BOARD	
	INTEGRATED CIRCUITS	
IC1	2-600-151-01-1	tE1041 MSM6551RS CPU
IC2	2-440-323-63-1	BA6238A MOTOR DRIVER
IC3	2-440-324-63-1	BA10393
	TRANSISTORS	
Q15, 16	2-402-109-25	KTC1627A-Y, PA
Q17	2-402-152-15	MPSA26, DARNGTDN
Q22, 23	2-402-111-35	KTC3198GR
	CONTROLS	
VR1	2-514-203-01-1	20KB EVNDCAAO3B24
	RESISTORS	
R33, 43	1-114-152-25	1.5KΩ, 1/4W, ±5%
RB4, 85	1-118-102-25	1KΩ, 1/4W, ±5%
R42	1-118-471-25	470Ω, 1/4W, ±5%
R15, 16, 17, 24, 25, 43	1-118-103-25	10KΩ, 1/4W, ±5%
R18	1-118-223-25	22KΩ, 1/4W, ±5%
R19, 37, 48, 49, 50, 51, 52, 53, 54, 55 56, 57, 75, 77, 78	1-118-473-25	47KΩ, 1/4W, ±5%
R40	1-118-221-25	220Ω, 1/4W, ±5%
R26	1-114-100-25	10Ω, 1/4W, ±5%
R28, 29, 30	1-114-182-25	1.8KΩ, 1/4W, ±5%
R31	1-114-332-25	3.3KΩ, 1/4W, ±5%
R32	1-114-392-25	3.9KΩ, 1/4W, ±5%
R35, 36	1-114-470-25	47Ω, 1/4W, ±5%
R39	1-118-224-25	220KΩ, 1/4W, ±5%
R68	1-118-683-25	68KΩ, 1/4W, ±5%
R41	1-118-472-25	4.7KΩ, 1/4W, ±5%
R44	1-118-105-25	1MΩ, 1/4W, ±5%
R45, 46	1-118-123-25	12KΩ, 1/4W, ±5%
R59, 60, 61, 72, 73	1-118-104-25	100KΩ, 1/4W, ±5%
R63, 64, 67	1-118-222-25	2.2KΩ, 1/4W, ±5%
R65, 66, 68	1-118-333-25	33KΩ, 1/4W, ±5%
	CAPACITORS	
C15, 16, 17	1-756-473-95	47000pF, ±20%, 50V
C18, 20	1-756-103-95	10000pF, ±20%, 50V
C22	1-756-104-95	100000pF, ±20%,50V
C55	1-756-103-95	10000pF, ±20%, 50V
	MISCELLANEOUS	
CN109	2-168-456-01-1	SBRK165-1 16P
WA110	2-168-392-01-1	52257-1110, 11P,
WA112, 114	2-168-389-01-1	52257-0510, 5P,
WA111, 113	2-168-394-01-1	52257-1510, 15P,
X1	2-138-185-01-1	FCR4.0. MCT3, CERAMIC OSC

PACKING DRAWING

Tape Deck : C-300/500

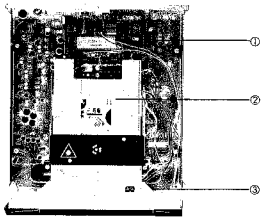


NO	PARTS NAME	PARTS NO.	Q'TY
1	PAD BOTTOM	3-127-916-01	1
2	PIN CORD	2-212-140-01	2
3	SHEET POLY	3-324-029-01	1
4	STICKER SET	3-819-817-01	1
5	INNER LID	3-324-019-01	1

4 HK-CD 300/500

INTERNAL VIEW

■ TOP VIEW



① PCB-1 Main p.c.board
② PCB-2 Control p.c.board
③ CD Mechanism

DISASSEMBLY PROCEDURES

1 TOP Cover Removal

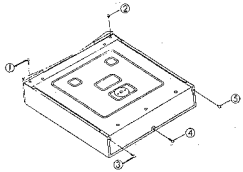


Fig. 1

1. Remove screws ① to ⑤ in Fig. 1
2. Remove the top cover

2 Rear Panel Removal

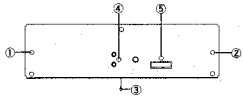


Fig. 2

1. Remove screws ① to ⑤ in Fig. 2, and then remove the rear panel

3 PCB-⑫ (Main PCB) Removal

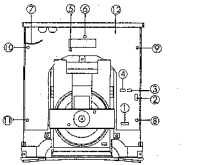


Fig. 3

1. Remove the rear panel (Refer to step [2])
2. Remove connectors ① to ⑥ in Fig · 3, and then unsolder the ground wire ⑦ which is connected the side frame (L)
3. Remove screws ⑧ to ⑪ in Fig. 3, and then remove main pcb ⑫ by pulling it to backward

4 Front Panel Assembly Removal

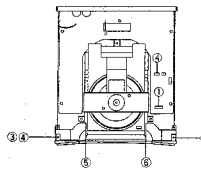


Fig. 4

1. Remove screws ① to ⑥ in Fig · 4.
2. Remove the front panel assembly by pulling it toward you gently

5 PCB-⑤ (Control PCB) Removal.

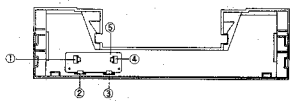


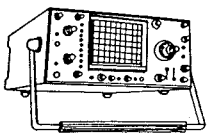
Fig · 5

1. Remove the front panel assembly (Refer to step [4])
2. Pull hooks ① to ④ in Fig · 5, and then remove the control pcb ⑤

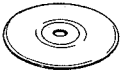
CDP:CD 300/500

1. METER AND JIG FOR ADJUSTMENT

1-1. Oscilloscope

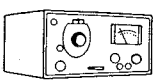


1-2 Test disc (Sony type 4;YEDS-18)

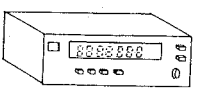


1-3. Jitter meter

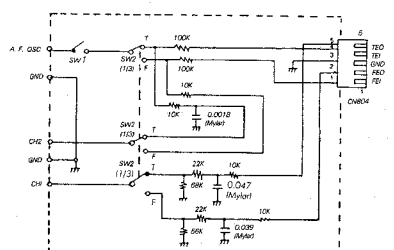
1-4. Low frequency oscillator



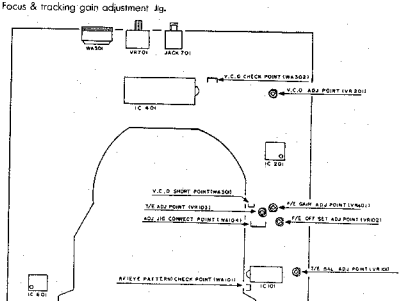
1-5. Digital frequency counter



1-6. 10:1 Oscilloscope probe
1:1 Oscilloscope probe



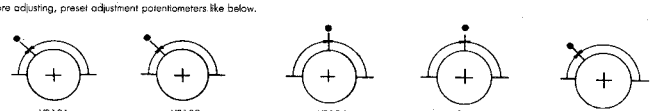
1-7. Focus & tracking gain adjustment Jig.



CDP: Adjustment point

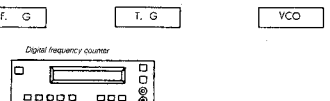
2. INITIAL SETTING OF ADJUSTMENT POTENTIOMETERS

Before adjusting, preset adjustment potentiometers like below.



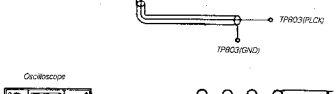
3. PLL (VCO) ADJUSTMENT

(1) Connect digital frequency counter to WA302(PLCK) and WA302 (GND).
(2) Shortcircuit WA301 (ASY) and WA301 (GND).
(3) Adjust VR201 so that the frequency counter reading becomes 3. 5MHz(±10kHz).



4. E-F BALANCE ADJUSTMENT

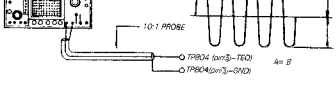
(1) Connect the oscilloscope to WA104 (pin⑤–TEO)and WA104 (Pin③–GND).
(2) Place test disc on turntable.
(3) Shortcircuit WA104 (pin ④–TEI) and WA104(pin ③–GND)
(4) Adjust VR101 so that the amplitude above and below the zero DC line becomes equal tamplitude A=B.
(5) Open circuit WA104 (pin ④–TEI)and WA104 (pin ③–GND)



5. FOCUS OFFSET ADJUSTMENT (without jitter meter)

(1) Place test disc on the turntable.
(2) Put unit into play mode.
(3) Connect oscilloscope to WA101 (RF) and wa101(GND).
(4) Adjust VR102 so that eye pattern become clear and waveform $(V_{p-p})$is maximum.

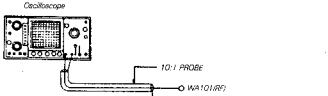
NOTE: When confirming eye pattern, you have to use 10:1 probe.



6. FOCUS OFFSET ADJUSTMENT (with jitter meter)

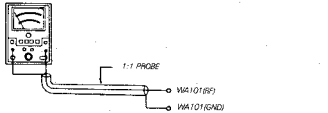
(1) Connect the jitter meter to WA101 (RF) and WA101 (GND), set the input selection switch of jitter meter to position of "×1".
(2) Place test disc on the turntable.
(3) Put unit into play mode.
(4) Adjust VR102 so that the jitter meter reading is minimum.

NOTE: Jitter meter must have input "×"mode selection switch.

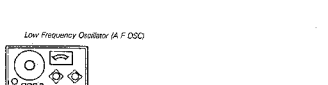


7. FOCUS GAIN ADJUSTMENT (with jig)

(1) Connect CN804 from gain adjustment jig to WA104 on the main P. C. board pin to pin.
(2) Connect audio frequncy oscillator to A. F. OSC terminal and GND on the gain adjustment jig.
Set the audio frequency oscillator outpqu to 550 Hz, 4 V_{RMS}.



(3) Connect oscilloscope to CH1, CH2, and GND on the main P. C. board.
(4) Insert test disc and put unit into play mode on track.
(5) Set swich SW2 on the gain adjustment jig to the position of "F".
(6) Set swich SW1 on.
(7) Adjust VR104 so that the waveform on the oscilloscope becomes like below.



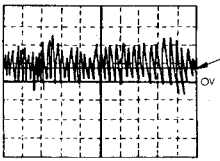
Good adjustment
(Optimum focus gain)

Bad adjustment
(In the case of low focus gain)

Bad adjustment
(In the case of high focus gain)

8. FOCUS GAIN ADJUSTMENT (without jig)

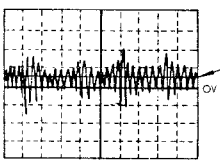
(1) Connect the Oscilloscope to WA104 (pin ②–FEOI and WA104 (pin ⑤–GND)
(2) Insert test disc and put unit into play mode on track.
(3) Adjust VR104 so that the waveform on the oscilloscope becomes like below.



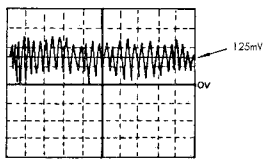
100mV/div:Volt/div.
2mS/div: Time/div.

NOTE: According to VR104 setting position, DC level of waveform varies.

Good adjustment
(Optimum focus gain)



Bad adjustment
(In the case of high focus gain)



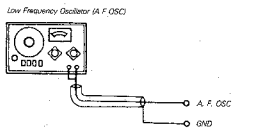
Bad adjustment
(In the case of low focus gain)

(4) This method will be convenient in the field. In spite of simple method, this method will not make serious problems.

9. TRACKING GAIN ADJUSTMENT (with jig)

(1) Connect CN804 from gain adjustment jig to WA104 on the main P. C. board pin to pin.
(2) Connect audio frequency oscillator to A. F. OSC terminal and GND on the gain adjustment jig.
Set the audio frequency oscillator output to 550Hz, 4 V_{RMS}.

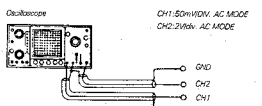
Low Frequency Oscillator (A.F.OSC)



(3) Connect oscilloscope to CH1, CH2 and GND on the main P. C board.
(4) Insert test disc and put unit into play mode on track.
(5) Set switch SW2 on the gain adjustment jig to the position of "T".
(6) Set switch SW1 on.
(7) Adjust VR103 so that the waveform on the oscilloscope becomes like below.

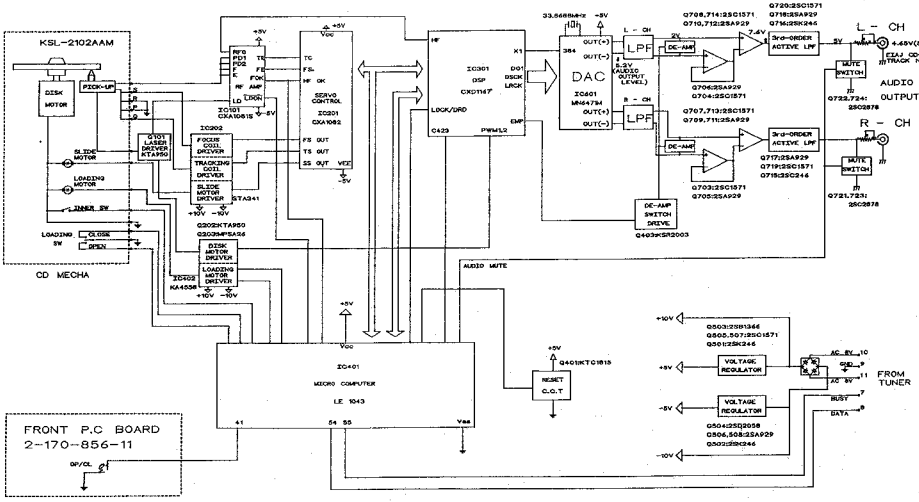
Oscilloscope

CH1:50mV/DIV. AC MODE
CH2:2V/div. AC MODE



①Good adjustment (Optimum tracking gain)
②Bad adjustment (In the case of low tracking gain)
③Bad adjustment (In the case of high tracking gain)

CD-300/500 CDP BLOCK DIAGRAM



-CDP-

1. APC CIRCUIT

A semiconductor laser is used as the light source for the optical pick-up. As the output from the semiconductor laser changes radically with changes in temperature, a circuit must be provided to stabilize this output. For this purpose, a monitor diode which detects the optical output of the laser diode is used in the semiconductor laser.

As the laser diode emits light from its bonded surface, light is emitted both in front and behind. The light emitted behind is monitored with the monitor diode installed on its rear surface, and the optical output is thus controlled. The light emitted in front becomes the light source for the pickup.

Fig. 1 shows the APC circuit.

When the temperature rises and the optical output decreases, the monitor diode current (IS) decreases, the electric potential of IC101 pin 5 rises, the base current of the driving transistor increases, and the laser diode current increases. This causes the reduced optical output to return to its former level.

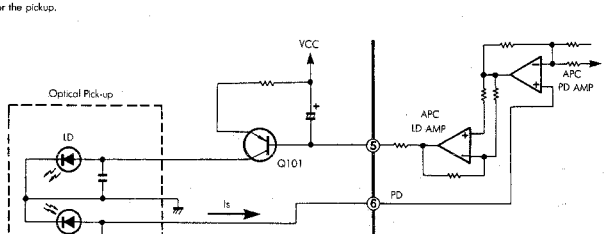


Fig. 1

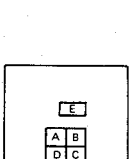
2. FOCUS SERVO

2-1. Optical pickup

This set employs a three-beam optical pickup comprised of six division photodiodes, A through F as shown in Fig. 2. The four photodiodes (A through D) at the center provide focus error detection by using their property to allow the beam to focus into a round image only at a certain point.

The sums of outputs from diagonal two elements of four division photodiodes (A+C and B+D)are compared by the differential amplifier in IC101 to detect the shape of the beam image.

The remaining two diodes (E and F) provide tracking error detection by means of sub-beam spots.



Three spotted (six-division) photo diodes

Fig. 2

2-2. Focus error detecting operation

The reflected laser beam from a disc is polarized 90° with the beam-splitter and sent to the cylindrical lens. The beam passed through this cylindrical lens is then sent to the four division photodiodes and focuses into an image whose shape varies with the distance between the disc and the objective lens. Such change in the beam shape causes the current flowing from the photodiodes to vary.

Shown in Fig. 3 is the Principle of the focus error detection.

The currents from the photodiodes (A+C and B+D) are applied to pins 7 and 8 of IC101 and converted to voltage by RF I-V amplifiers (11) and (12) included in IC101.

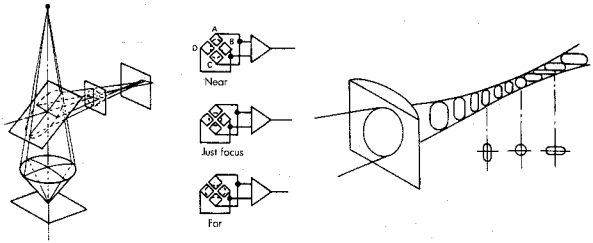


Fig. 3

2–3. Focus servo servo control operation

The focus error signal, after begin converted to voltage by the RF I–V amplifier, is transmitted to the operation amplifier in the IC and output from pin 19.

When the disc to objective lens distance is in just focus, the beam forms a true round. In this state, the beams applied to four elements of four division photodiodes become equal and thus the output provided then is 0 (zero). When the disc to objective lens distance is too close (near focus), the beam is reflected divergently to form an oval in crosswise direction. In this state, the outputs provided from photodiodes A and C are higher than those from B and D, resulting in negative (–) output voltage. On the other hand, when the distance is too far (far focus), the beam is reflectd convergently to form an oval in longitudinal direction. Then the outputs from photodiodes B and D are higher, resulting in positive (+) output.

The output voltage(focus error signal)from pin 19 of IC101 passes through IC201, in from pin 48 and out from pin 5, and IC202, in from pin 4 out from pin 6 as shown in Fig. 4. It is amplified in each IC and fed to the focus coil which then drives the objective lens of the pickup.

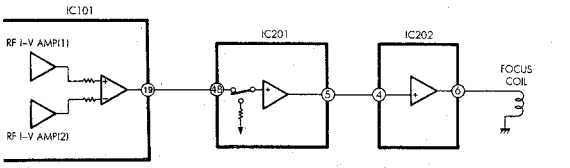


Fig. 4

2.4 Tracking error detection system

Fig. 5 shows the principle of the tracking error detection system which employs the three beam system.

The laser beam is divided into the main beam and two sub-beams by diffraction grating and they are arranged on one line. The center line connecting these three beams has a slight offset angle against the main beam. The main beam is received by photodiodes A, B, C and D and two sub-beams by E and F respectively.

Fig. 5–A shows the on-track state. As both auxiliary beams 1 and 2 are slightly on the track in this state, the outputs of photodiodes E and F are equal and the tracking signal is 0(zero). When the track is shifted to the left (Fig. 5-B), the auxiliary beam 1 is off the pit. This allows more light to be received by the photodiode E, resulting in positive (+)tracking signal output. On the other hand, when the track is shifted to the right (Fig. 5–C), the amount of light received by the photodiode F increases, resulting in negative(–) tracking signal output. And these extreme signals are detected as tracking error signals.

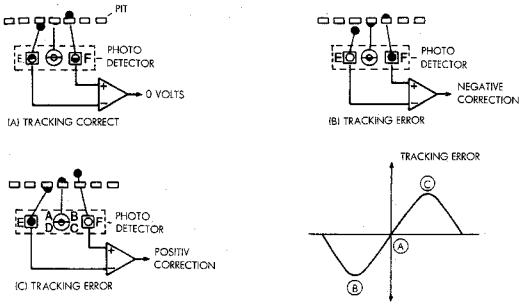


Fig. 5

2–5. Tracking servo control operation

When a tracking error signal is detected by photodiodes E and F, it is fed to pins 11 and 10 of IC101 respectively as shown in Fig. 6. In IC101, the signal is converted into voltage by the E I–V amplifier and F I–V amplifier, transmitted to the tracking error amplifier and output through pin 20. While it passes through IC201, in from pin 45 and out from pin 11, and IC202, in from pin 3 and out from 7, it is amplified in each IC and sent to the tracking coil to adjust pickup so that the amount of track shift is reduced as closely to none as possible.

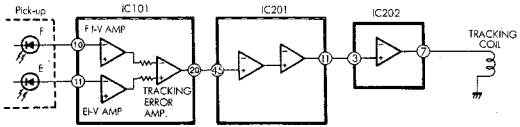


Fig. 6

3. Regenerative Circuit

3–1 RF circuit

The currents from photodiodes a, b, c and d are fed to IC101 through pins 7 and 8 and converted to voltage by RF I–V amplifiers (1) and (2) respectively there, added by the RF summing amplifier and output from pin 2 as a signal. As it is sent to pin 5 of IC301, it can be checked at the test point (WA101) provided on its way by means of the eye pattern check.

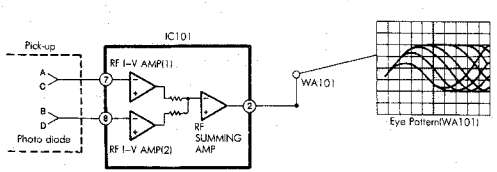


Fig. 7

3–2. EFM demodulation, error correction, serial/parallel conversion

EFM demodulation, error correction and serial/parallel conversion are performed by the internal circuitry of IC301. The eye-pattern signals from pin 27 of IC101 are sent to pin 5 of IC301, then demodulated from 14 bits to 8 bits by EFM readjustment. At the same time any error, if found, is corrected (CIRC) and the signals are sent to the D/A converter interface. After that, they are output as 18-bit digital signals from pins 76, 78 and 80 of IC301 and fed to the D/A converter of IC601.

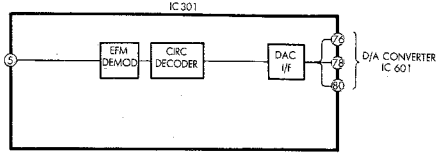


Fig. 8

4. 1-bit D/A Converter

Conventionally, high-precision D/A conversion was mainly carried out using resistor ladder systems. There was, however, one main drawback with these systems, which was that zero cross distortion was likely to be generated. To achieve production of a high-precision D/A converter with a minimum amount of zero cross distortion, it would be necessary to carry out complicated and bothersome processes such as laser trimming processing. In addition, use of such D/A converter would require a sampling-and-hold circuitsfor deglitcher circuit) and an intricate analog filter with special characteristics When mounting it.

To solve these difficulties, we used a 1-bit D/A converter with 3rd order noise

shaping technologyIIC601 : MIN 6471M)

4–1. Features and Configuration of MN6471M

Features
1. No zero cross distortion
2. No non linear distortion
3. Built-in 4 times oversampling digital filter
4. 2 channels (left and right) built in
5. 4DAC configuration possible
6. Single 5V power supply operation

The block diagram is shown in Fig. 9. The MN6471M is configured of a digital filter, a 3rd order noise shaping circuit, and a PWM.

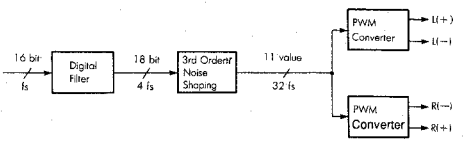


Fig. 9

4–2. Configuration of MN6471M

Fig. 10 shows the configuration of the MN6471M. The sampling frequency of the input data is expressed in fs, so the 3rd order noise shaping circuit operates at 32fs. This means that a 32-times oversampling filter is required. In this LSI, however, oversampling is carried out first at 4fs in the first digital filter, and following that, a O order hold takes place in the 3rd order noise shaping circuit. This enables conversion of the 4fs signal to a 32fs signal.

The digital filter, using 384fs as clock signals, and the noise shaping section, uses 64fs, carry out time division processing on the data for the left and right channels. The PWM section, using 768fs as a clock signal, carries out signal processing for the left and right channels independently.

In the noise shaping section, the 19-bit 32fs signal is converted to 11 values and pulse width modulation (PWM) in carried out on these signals in the PWM section. D/A conversion is carried out in this way. Following are the descriptions of the various blocks.

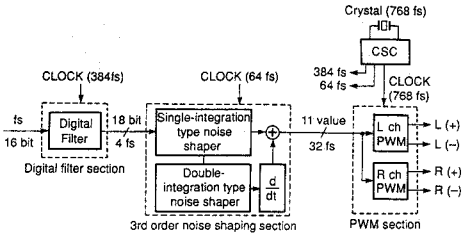


Fig. 10

5. Digital filter

Fig. 11 shows the signal data of an audio signal up to 20 kHz that has been digitalized, along with the frequency distribution of the signal data. The graphs show the conditions for a sampling frequency of 44. 1 kHz, plus its doubled frequency, 88.2 kHz, and its quadrupled frequency, 176.4 kHz.

As the figure shows, for the same signal up to 20 kHz, the noise portion of the digitalized signal component tends to shift toward the higher range of the signal if the sampling frequency is increased. However, at any sampling frequency, the volume of necessary audio signal information remains constant up to 20 kHz. This allows certain important results to be derived; that is, if the information represented in section (a) is obtained, then it should be possible to create a signal in the form shown in(b) or (c).

When the noise caused by sampling shifts to the higher frequency range, as shown in (b) or (C), the low pass filter characteristic to eliminate noise during re-conversion to an audio signal need not be steep but can be rather gradual as shown. It is comparatively simple to provide a high audio quality low pass filter of such characteristic with little phase fluctuation or distortion.

The question now becomes how to make a signal sampled at 44. 1 kHz resemble one sampled at a much higher frequency. Fig. 12 shows the signal sequence sampled at the same 44.1 kHz as in Fig. 11 and its frequency distuibrtion.

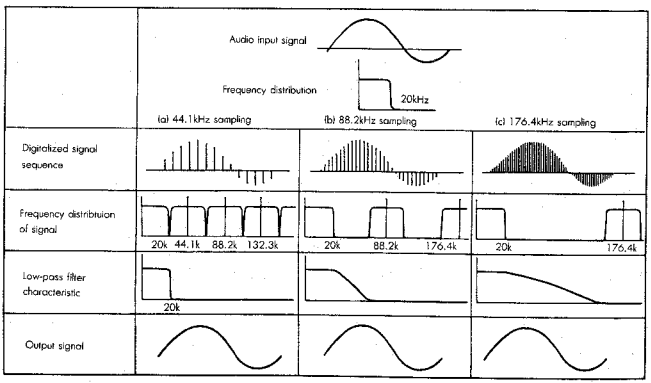


Fig. 11

If the frequency is to be doubled as the first step in increasing the sampling frequency of the signal, zero-level data is added between the data marked with X in Fig. 12(b). In the original signal sequence sampled at 44.1 kHz, there are data only at the points of the sampling timing, while the intervals between those points have all been made zero-level. Introducing zero data in these intervals does not change the original data in any way, nor is the frequency distribution altered. Only the sampling frequency is double.

Passing this data in its modified form through a digital filter with the characteristic shown in Fig. 12(c) causes the portion corresponding to N1 to be eliminated, resulting in a signal sequence with the frequency distribution shown in (d). This signal sequence possesses exactly the same shape as that obtained for the signal in Fig. 11(b), sampled at 88.2 kHz. In other words, this method enables the sampling frequency to be doubled.

The digital filter used in this unit is a Finite Inpulse Response type. Its circuit diagram is shown in Fig. 13.

The sampling frequency of this unit has been quadrupled, and the phase characteristic has been improved by using a softer analog low-pass filter.

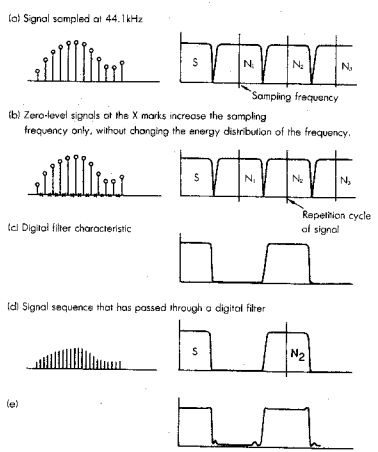


Fig. 12

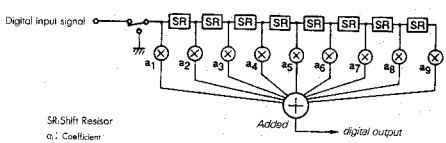


Fig. 13

6. Noise shaper

a) Single-integration noise shaper

The block diagram is shown in Fig. 14.

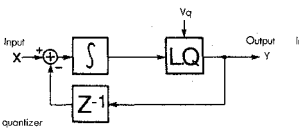
According to the figure, the relation between input X and output Y is as follows:

$$Y=X+(1-Z^{-1})Vq\cdots\cdots(1)$$

The quantization error Vq is a random value, and $(1-Z^{-1})$expresses the differential characteristic. Thus, according to equation (1), the spectrum of the quantization error Vq for the single-integration noise shaper has a characteristic of 6dB/oct, and the lower the frequency is, the greater the attenuation becomes. (This is because the noise distribution can be changed by the noise shaper).

b) Double-integration noise shaper

The block diagram is shown in Fig. 15.



LQ:Local quantizer
Z^{-1}:Delay
Vq:Quantization error
$\int$:Integrator

Fig. 14

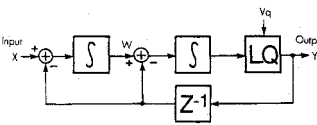


Fig. 15

In Fig. 15, the path to the output seen from W has a configulation identical to that of the single-integration noise shaper, so that relation between W and Y is:

$$Y=W+(1-Z^{-1})Vq\cdots\cdots(2)$$

The relation between X and Y is:

$$W=\frac{1}{1-Z^{-1}}(X-Z^{-1}Y)\cdots\cdots(3)$$

And the result obtained from above equations (2) and (3) is:

$$Y=X+(1-Z^{-1})^2Vq\cdots\cdots(4)$$

Comparison with equation (1) shows that the term $(1-Z^{-1})$ is a square of itself. In other words, with the double-integration noise shaper, the spectrum of the quantization error Vq is attenuated at a slope of 12dB/oct.

Fig. 16 shows the output spectrum of the noise shaper.

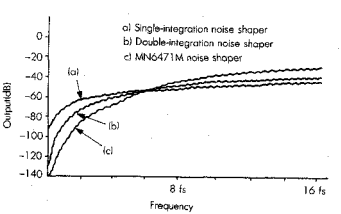


Fig. 16

6–2. 3rd order noise shaper

The block diagram of the 3rd order noise shaper is shown in Fig. 17.

This configuration shows that the first stage uses a single-integration noise shaper and the following stage uses a double-integration noise shaper. The quantization error of the first stage is input at the second stage.

In this configuration, single-integration and double-integration noise shapers are connected at several stages, and the quantization error of the previous state is quantified again at the following stage, so that the quantization error included in the output of the previous stage is negated. In this way, compensation is carried out.

In this noise shaping circuit, the input is expressed as X, the output as Y, and the re-quantized error as Vq, and their relation for each order is shown in the following equations.

(1st order) $Y=X+(1-Z^{-1})Vq$

(2nd order) $Y=X+(1-Z^{-1})^2Vq$

(3rd order) $Y=X+(1-Z^{-1})^3Vq$

In noise shaping, as the order of the transfer coefficient called$(1-Z^{-1})$becomes larger, the noise in the 1/2 fs audio band moves higher in the frequency range. The result is that, within a narrow audio band, an 18-bit performance can be obtained even from a 1-bit DAC

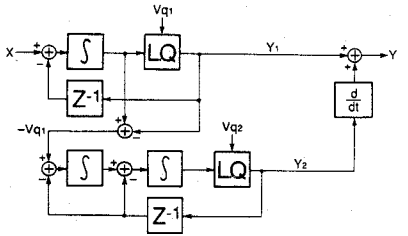


Fig. 17

$Y_1 = X + (1-Z^{-1})\,Vq_1$ ..... (5)

$Y_2 = Vq' + (1-Z^{-1})^2\,Vq_2$ ..... (6)

$Y = Y_1 + (1-Z^{-1})\,Y_2$ ..... (7)

The result obtained from above equations (5)~(7) is:

$Y = X + (1-Z^{-1})^2\,Vq^2$ ..... (8)

7. PWM Output Section

In the output from the MN6471M noise shaper, the 11 value data of the 32fs is output. In the PWM section, pulse width modulation (PWM)is carried out on that signal, enabling D/A conversion.
Fig. 18 shows the PWM section of the MN6471M.

The 11 value digital data output from the noise shaper is converted (1-bit data stream) to pulse signal With11 pulse widths precisely controlled by the crystal OSC and output as an analog signal. In the PWM output section, signals from both left and right channels are output as differential output so that the synchronous-phase noise is eliminated and the 2nd order high-frequency distortion is reduced.

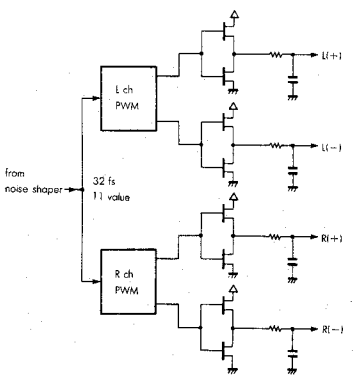


Fig. 18

8. Audio Circuit

Fig. 19 shows a block diagram of the audio circuit.

The outputs from Pin 14(OUT (+)) and Pin 11 OUT (–) pass through the 2-step LPF which consists of C702, R704 and R702 for one and C704 and R 706 for the other, and the high frequency component of the PWM output from DAC is removed.

Then the (+) side component of the PWM is inputted directly, and its (–) side componenty through the inverted darligton buffer circuit consisting of Q704 and Q706 to the discrete circuit amplifier cocsisting of Q708, Q710, Q712 and Q714, where they are synthesized into an approximately 2V signal voltage which is then output to the LPF circuit of the next stage.

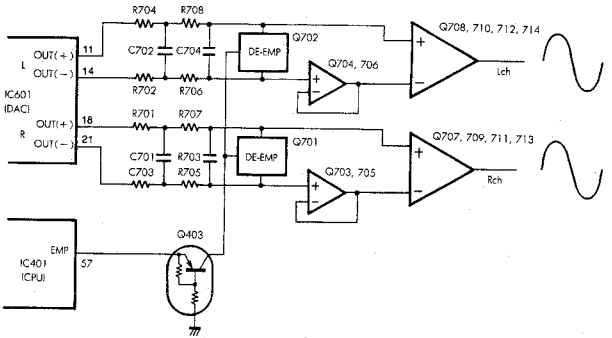


Fig. 19

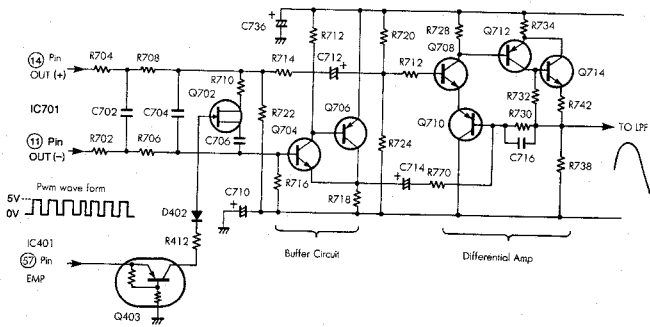


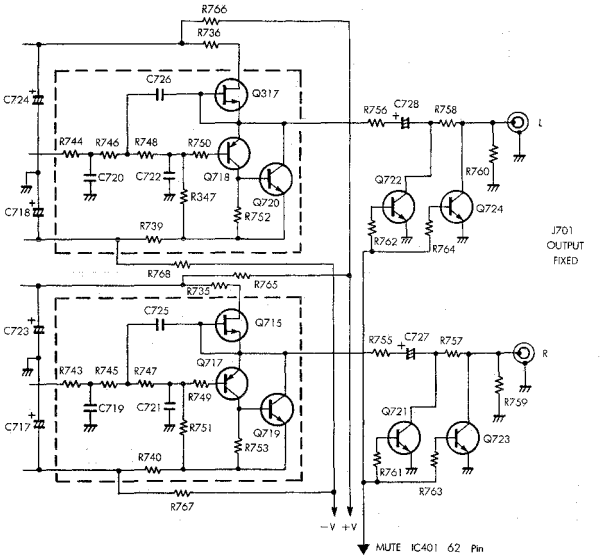
Fig. 20

The emphasis data from the disc is output through the terminal (Pin 57) of IC401. When a disc to which emphasis is applied is played back, this terminal is set high and Q403 turns ON. Following this, Q702 are also turned ON. Then connected C706 and R710 provides the DE-Emphasis characteristics. Fig. 20 shows the buffer circuit and the differential amplifier. (Right channel only)

9. Low-Pass filter

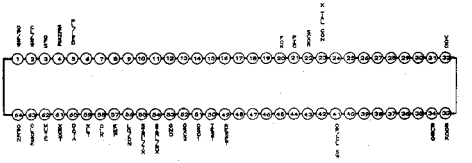
Fig. 21 shows a final-stage circuit which includes a low-pass filter and other elements.

The portion of Fig. 21 enclosed by the broken line is 3rd -other active LPF. This LPF causes noise in the high range to be cut. Q718 and Q720 (left channel) and Q717 and Q719 (Right channel) are buffer circuit of inverted darlington configuration. Q716 and Q715 are FET controlled constant current circuits. Q725, Q726, Q722, Q721, Q723 and Q724 are power muting circuit.

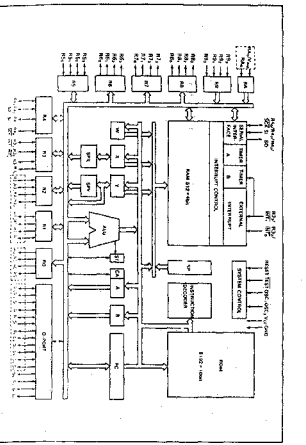


IC FUNCTION BLOCK DIAGRAM

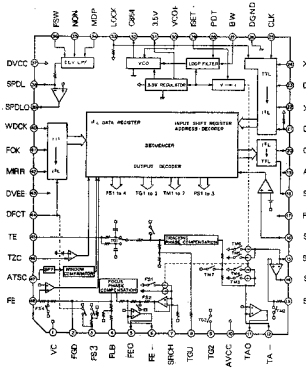
IC 401 : MICRO COMPUTER LE1043(HMCS 408 AC)



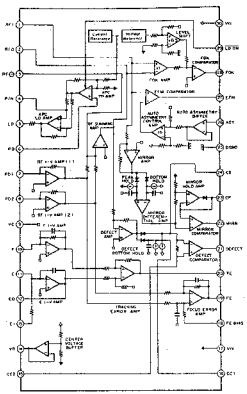
LE 1043		INPUT/	FUNCTION DESCRIPTION
TERMINAL	NO	OUTPUT	
OP/SW -	1	INPUT	SWITCH INPUT INDICATING THAT TRAY IS OPEN"CON ACTIVE"
CL/SW	2	INPUT	SWITCH INPUT INDICATING THAT TRAY IS CLOSE"CON ACTIVE"
GFS	3	INPUT	IMPORT TERMINAL FOR REVOLUTION SYNCHRONOUS SIGNAL.
SENSE	4	INPUT	DETECTING SIGNAL FORSERVO MODE.
PLAY LED	5	OUTPUT	CONTROL OUTPUT FOR ON/OFF OF PLAY LED
N.C	6-19		UNUSED.
FOK	20	INPUT	INPUT TERMINAL FOR FOCUS SYNCHRONOUS SIGNAL.
PIC	21	INPUT	PIN FOR DETECTING A SIGN. FOR THE ON/OFF LIMIT SWITCH OF THE PICK-UP.
SCOR	22	INPUT	SYNCHRONOUS SIGNAL INPUT OF SUB-CODE.
N.C	23		UNUSED.
X-TAL CON	24	OUTPUT	CONTROL OUTPUT FOR ON/OFF OF X-TAL(33. 86MHz)
N.C	25-31		UNUSED.
VCC	32		POWER SUPPLY DC+5V.
SCCK	33	IN/OUTPUT	CLOCK FOR READING SUB-CODE
SUBQ	34	INPUT	IMPORT TERMINAL FOR SUB-CODE DATA.
N.C	35-40		UNSED.
OP/CL SW	41	INPUT	OPEN/CLOSE KEY INPUT TERMINAL.
N.C	42-48		UNUSED.
RESET	49	INPUT	C.P.U RESET INPUT.
TEST	50	INPUT	UNUSED. CONNECT TO VCC.
OSC1	51	INPUT	SYSYEM CLOCK OSCILLATOR.FCLK = 3.0MHz
OSC2	52	OUTPUT	
GND	53	INPUT	GROUNDING TERMINAL.
SRL/RX/TX	54	IN/OUTPUT	CONTROL SIGNAL IN/OUTPUT OF SYSTEM.
BUSY	55	IN/OUTPUT	
LD/ON	56	OUTPUT	CONTROL OUTPUT FOR ON/OFF LASERDIODE."LOW ACTIVE"
EMP	57	OUTPUT	EMPHASSIS DETECT.
CLK	58	OUTPUT	OUTPUT TERMINAL OF SIGNAL TRANSFER CLOCK FOR SERVO CONTROL SIGNAL.
XLT	59	OUTPUT	OUTPUT TERMINAL OF LATCH FOR SERVO SYNCHRONOUS SIGNAL.



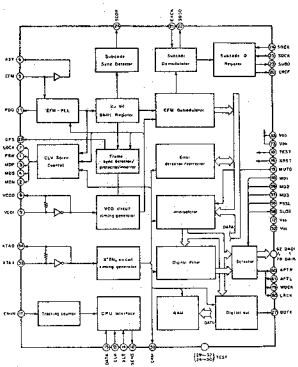
IC 201 : C X A 1082 BQ OPTICAL PICK-UP SERVO CONTROL



IC 101 : C X A 1081 S RF AMP

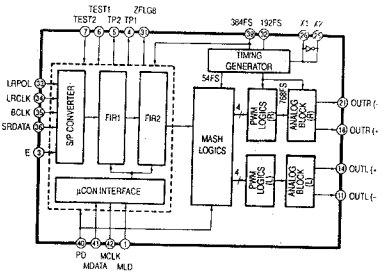


IC 301 : C X D 1167Q DIGITAL SIGNAL PROCESSOR AND DYNAMIC RAM

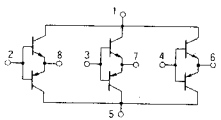


Note) These pins are for the QFP. For WQFP they are different. See Pin Description.

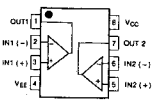
IC 601 : MN 6471 M DIGITAL FILTER & D/A CONVERTER



IC 202 : STA 341 M TR ARRAY

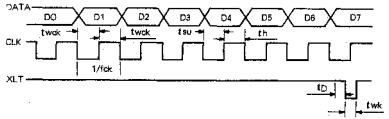


IC 402 : MC 4558 C 2-CH OP-AMP



TIMING CHANT

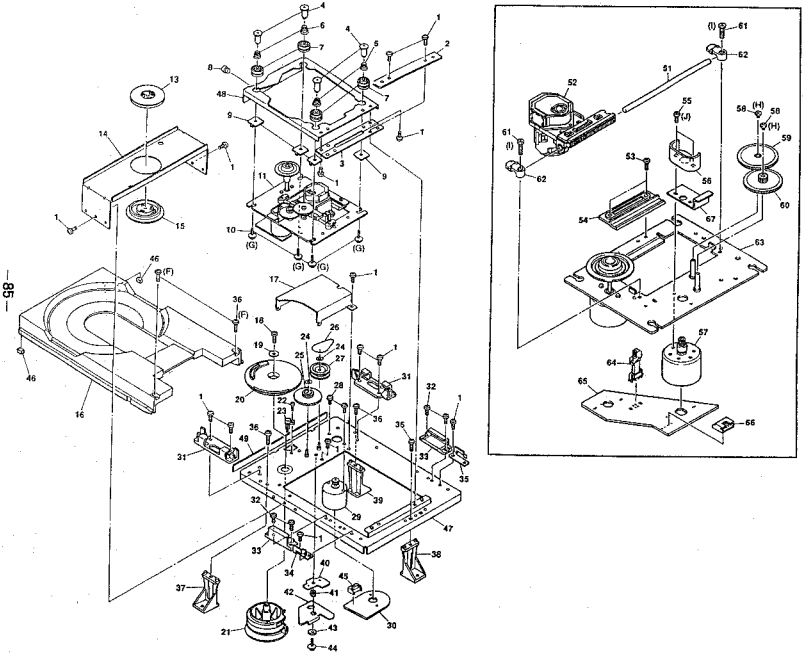
CDP : CD-300/500



Vcc 5.0 V

Item	Symbol		Unit
Clock frequency	f_{ck}		MHz
Clock pulse width	t_{wck}	500	ns
Hode time	t_{hs}	500	ns
Steup time	t_h	500	ns
Delay time	t_D	500	ns
Latch pulse width	t_{WL}	1000	ns

CD MECHANISM EXPLODED VIEW

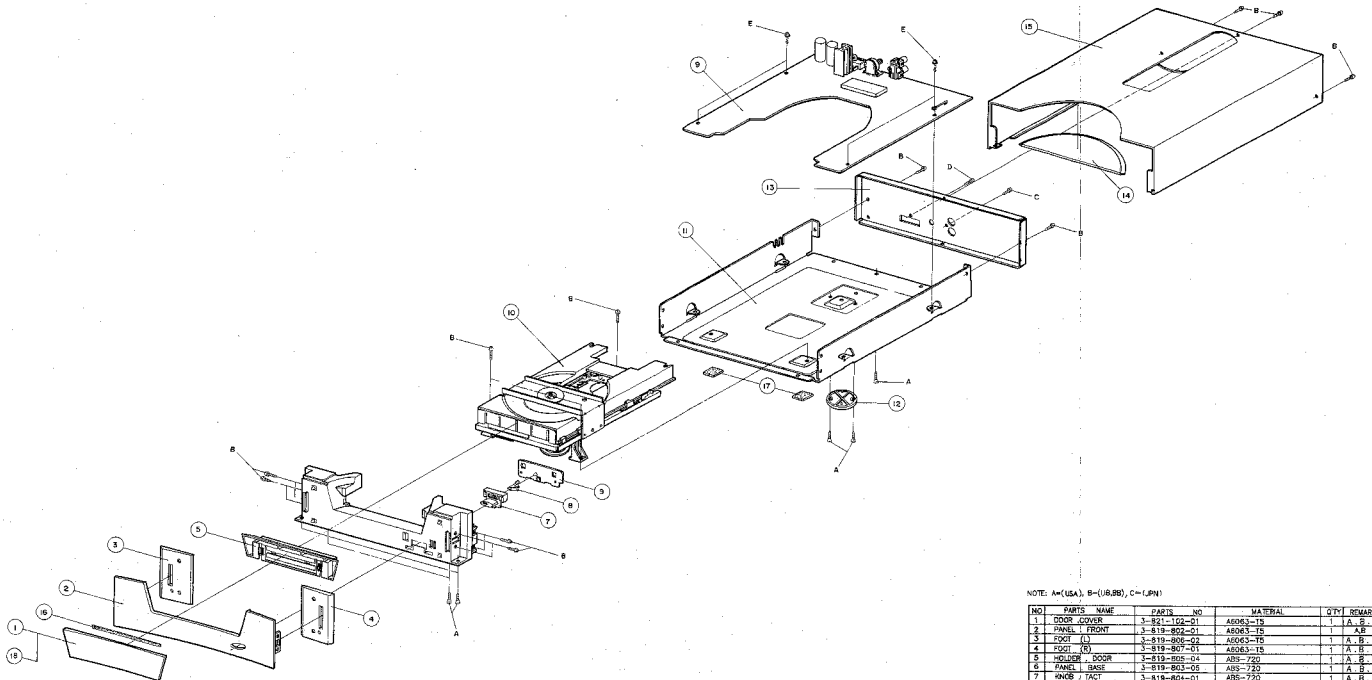


PARTS LIST

Ref. No.	Part No.	Description
1	7-685-662-01	SCREW (+)(2.6x6mm)
2	2-642-176-01	HINGE HOLDER
3	2-642-164-01	HINGE
4	2-642-160-01	SHAFT
5	2-642-157-02	COIL SPRING (B)
6	2-642-139-02	COIL SPRING (A)
7	2-642-158-01	INSULATOR (C)
8	2-642-169-02	ROLLER
9	2-642-159-01	PLATE (F)
10	2-642-142-01	SCREW
11	8-848-164-01	CD PLAYER SUB UNIT ASSY
13	8-2642-106-1	MAGNET ASSY
14	2-642-165-01	CHUCK CHASSIS
15	2-642-141-01	CHUCKING PULLEY
16	2-642-156-02	TRAY
17	2-642-149-02	GEAR COVER
18	7-685-535-19	SCREW (+)(2.6x10mm)
19	4-412-554-01	WASHER
20	2-642-154-02	DRIVE GEAR
21	2-642-153-01	CONTROL CAM
22	7-685-651-01	SCREW (+)(2x4mm)
23	1-570-662-11	LEAF SWITCH
24	3-558-706-21	LOCK WASHER
25	2-642-145-01	CENTER GEAR
26	3-563-367-01	LM BELT
27	4-913-751-01	LOADING PULLEY
28	7-621-775-09	SCREW (+)(2.6x3mm)
29	X-2641-536-1	MOTOR ASSY
30	1-564-780-21	MOTOR P.C. BOARD
31	2-642-151-01	TRAY HOLDER, FRONT
32	7-685-781-01	SCREW (+)(2x4mm)
33	2-642-152-03	TRAY HOLDER, REAR
34	2-642-146-02	TRAY GUIDE, RIGHT
35	2-642-147-02	TRAY GUIDE, LEFT
36	7-685-647-19	SCREW (+)(2x10mm)
37	2-642-510-01	HOLDER, RIGHT
38	2-642-512-01	HOLDER, REAR
39	2-642-511-01	HOLDER, LEFT
40	2-642-173-01	LINK PLATE
41	2-642-133-02	BOSS
42	X-2642-109-1	STOPPER LINK ASSY
43	2-642-172-01	SPACER
44	7-682-902-31	SCREW (+)(2.6x8mm)
45	1-564-721-11	CONNECTOR, 5 PIN
46	2-642-125-01	DAMPER
47	X-2642-105-2	MAIN CHASSIS ASSY
48	X-2642-106-2	SUB CHASSIS ASSY
49	2-642-157-02	FRONT TAPE
51	2-642-437-02	SLIDE SHAFT
52	8-845-127-31	PICK-UP ASSY
53	2-641-086-01	SPECIAL SCREW (2x5mm)
54	2-641-443-02	SLIDE HOLDER
55	7-621-256-35	SCREW (+)(2x5mm)
56	2-641-434-01	GEAR COVER
57	X-2641-238-1	SLIDE MOTOR ASSY
58	3-303-909-31	SPECIAL SCREW (M1.7x3mm
59	2-641-404-02	GEAR (A)
60	2-641-403-06	GEAR (B)
61	2-641-447-01	SCREW (+)(2.6x8mm)
62	2-641-448-02	SHAFT CLAMP
63	X-2641-556-1	DISC MOTOR ASSY
64	1-570-663-12	LEAF SWITCH
65	1-628-263-11	MOTOR P.C. BOARD
66	1-564-720-11	CONNECTOR, 4 PIN
67	2-641-271-01	STOPPER

EXPLODED VIEW

CDP : CD-300/500



NOTE: A=(USA), B=(UB,BB), C=(JPN)

NO	PARTS NAME	PARTS NO	MATERIAL	QTY	REMARK
1	DOOR COVER	3-821-102-01	A5063-T5	1	A,B,C
2	PANEL FRONT	3-819-802-01	A5063-T5	1	A,B
3	FOOT (L)	3-819-806-02	A5063-T5	1	A,B,C
4	FOOT (R)	3-819-807-01	A5063-T5	1	A,B,C
5	HOLDER DOOR	3-819-805-04	ABS-720	1	A,B,C
6	PANEL BASE	3-819-803-05	ABS-720	1	A,B,C
7	KNOB TACT	3-819-804-01	ABS-720	1	A,B,C
8	LENS KNOB	3-324-012-02	SBR (K-RESIN)	1	A,B,C
9	PCB UNIT ASSY	A-170-858-02	MAIN	1	A,B,C
10	MECHANISM CDP	2-219-116-01	SONY MECHANISM	1	A,B,C
11	CHASSIS MAIN	3-819-808-05	SECC T1.0	1	A,B,C
12	FOOT REAR	3-324-011-01	ABS-720	1	A,B,C
13	PANEL REAR	3-819-810-21	SECC T0.8	1	A,B,C
14	WINDOW MECHA	3-819-812-02	PMMA-SON	1	A,B,C
15	TOP COVER	3-819-809-01	SECC T0.6 (SPRAY)	1	A,B,C
16	CUSHION DOOR	3-819-815-03	FELT + TAPE (T0.5)	1	A,B,C
17	COVER SCREW	3-819-816-01	EVA GRAY T5.5	2	A,B,C
18	DOOR COVER(CD500)	3-821-002-01	A5063-T5	1	A,B,C
A	SCREW	7-484-408-01	CBZ 30P050FZK	8	A,B,C
B	SCREW	7-784-406-01	VBZ 30P050FZK	11	A,B,C
C	SCREW	7-999-168-01	PBT 30P100FZK	1	A,B,C
D	SCREW	7-784-410-01	VBZ 30P100FZK	1	A,B,C
E	SCREW	7-346-408-01	ATZ 30P080FZK	4	A,B,C

rm-00162 / Druck 9

ELECTRICAL PARTS LIST

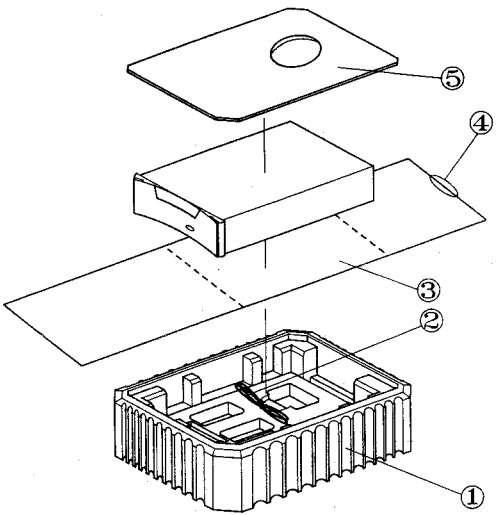
CDP : CD-300/500

REF. No	Part No.	Description
	PCB-1 MAIN P.C. BOARD	
	RESISTORS	
R505, 506	1-115-109-25	1Ω 1/4W, ±5%
R733, 734, 735, 736, 739, 740, 741, 742	1-118-229-25	2.2Ω 1/4W, ±5%
R507, 765, 766, 767, 768	1-118-479-25	4.7Ω 1/4W, ±5%
R602	1-118-100-25	10Ω 1/4W, ±5%
R105	1-118-220-25	22Ω 1/4W, ±5%
R757, 758	1-118-470-25	47Ω 1/4W, ±5%
R601, 749, 750, 755, 756	1-118-101-25	100Ω 1/4W, ±5%
R405, 727, 728	1-118-221-25	220Ω 1/4W, ±5%
R307, 725, 726	1-118-331-25	330Ω 1/4W, ±5%
R303, 304, 305, 501, 502, 737, 738	1-118-471-25	470Ω 1/4W, ±5%
R743, 744, 753, 754	1-118-561-25	560Ω 1/4W, ±5%
R110, 111, 411, 503, 504, 604, 605, 711, 712, 717 718, 731, 732,745, 746, 747, 748, 426, 421	1-118-102-25	1KΩ 1/4W, ±5%
R772, 773	1-118-122-25	1.2KΩ 1/4W, ±5%
R214, 404, 713, 714	1-118-222-25	2.2KΩ 1/4W, ±5%
R101, 774, 775	1-118-392-25	3.9KΩ 1/4W, ±5%
R106, 107, 415, 603	1-118-472-25	4.7KΩ 1/4W, ±5%
R769, 770	1-118-682-25	6.8KΩ 1/4W, ±5%
R206	1-118-822-25	8.2KΩ 1/4W, ±5%
R103, 109, 210, 211, 212, 302, 701, 702, 703 704, 705, 706, 707, 708, 729, 730	1-118-103-25	10KΩ 1/4W, ±5%
R709, 710	1-118-123-25	12KΩ 1/4W, ±5%
R403, 761, 762, 763, 764	1-118-153-25	15KΩ 1/4W, ±5%
R102	1-118-183-25	18KΩ 1/4W, ±5%
R104, 204, 216	1-118-223-25	22KΩ 1/4W, ±5%
R411, 406, 416	1-118-473-25	47KΩ 1/4W, ±5%
R402, 721, 722	1-118-683-25	68KΩ 1/4W, ±5%
R751, 752	1-118-753-25	75KΩ 1/4W, ±5%
R201, 715, 716	1-118-823-25	82KΩ 1/4W, ±5%
R108, 202, 207, 209, 301, 407, 408, 719, 720 739, 760	1-118-104-25	100KΩ 1/4W, ±5%
R203, 205, 213, 409, 410	1-118-124-25	120KΩ 1/4W, ±5%
R414	1-118-154-25	150KΩ 1/4W, ±5%
R723, 724	1-118-184-25	180KΩ 1/4W, ±5%
R208	1-118-514-25	510KΩ 1/4W, ±5%
R219, 401, 412, 413	1-118-105-25	1MΩ 1/4W, ±5%
	CONTROLS	
VR701	2-501-393-01	20KB X 2 RK16K1250101-20KB
VR101, 103, 104	2-512-223-01	6MMRH0615SCI, 22K
VR102	2-512-473-01	6MMRH0615SCI, 47K
VR201	2-512-222-01	6MMRH0615SCI, 2.2K
	CAPACITORS	
C715, 716	1-976-100-11	10pF, ±5%, 50V, MICA
C703, 704	1-976-330-41	33pF, ±5%, 50V, MICA
C701, 702	1-976-820-41	82pF, ±5%, 50V, MICA
C711, 712	1-943-100-65	10µF, ±20%, 16V, AH ELEC
C713, 714	1-942-330-65	33µF, ±20%, 10V, AH ELEC
C601, 602, 603, 604, 605, 606	1-942-470-65	47µF, ±20%, 10V, AH ELEC
C717, 718, 723, 724, 727, 728	1-942-101-67	100µF, ±20%, 10V, AH ELEC
C706, 707, 708, 709	1-942-221-67	220µF, ±20%, 10V, AH ELEC
C607, 608	1-806-050-15	5pF, CH, 50V, ±5%, CERAMIC
C401, 402	1-806-100-15	10pF, CH, 50V, ±5%, CERAMIC
C102	1-806-120-45	12pF, CH, 50V, ±5%, CERAMIC
C105, 112, 210, 301, 303, 404, 609	1-736-472-45	4700pF, F, 50V, ±5%, CERAMIC
C103	1-506-102-45	1000pF, 50V, ±5%, MYLAR
C705, 706, 719, 720, 721, 722	1-506-152-45	1500pF, 50V, ±5%, MYLAR
C101	1-506-222-45	2200pF, 50V, ±5%, MYLAR
C116, 117, 211	1-506-472-45	4700pF, 50V, ±5%, MYLAR
C725, 726	1-506-562-45	5600pF, 50V, ±5%, MYLAR
C108, 111, 207, 208, 215	1-506-103-45	10000pF, 50V, ±5%, MYLAR

REF. No	Part No.	Description
C105, 109, 216	1-506-333-45	33000pF, 50V, ±5%, MYLAR
C202	1-506-473-45	47000pF, 50V, ±5%, MYLAR
C201, 204, 501, 502,	1-506-104-45	100000pF ±.50V, ±5%, MYLAR
C110, 217	1-416-478-65	0.47µF, ±20%, 50V, ELEC
C212, 213, 403	1-416-010-65	1µF, ±20%, 50V, ELEC
C203, 403	1-416-479-65	4.7µF, ±20%, 50V, ELEC
C206	1-416-100-65	10µF, ±20%, 50V, ELEC
C104, 107, 113, 114, 115, 205, 209, 214, 219 302, 304, 405	1-412-470-65	47µF, ±20%, 10V, ELEC
⚠ C505, 506	1-413-221-65	220µF, ±20%, 16V, ELEC
⚠ C507, 508	1-412-102-67	1000µF, ±20%, 10V, ELEC
⚠ C503, 504	1-413-472-67	4700µF, ±20%, 16V, ELEC
C406	1-446-229-65	2.2µF, ±20%, 50V, EIEC
	INTEGERATED CIRCUITS	
IC101	2-440-418-74-1	CXA-1081SDIP TYPE)
IC201	2-440-408-74-1	CXA-1082BQ
IC301	2-440-423-74-1	CXD-1167Q, DSP+SRAM
IC401	2-600-103-01-1	ZTAT, HD40740085
	OR 2-600-153-02-1	LE1043, HMCS408AC
IC601	2-441-437-51-1	MN6471M
IC202	2-442-026-79-1	STA341M
IC402	2-441-236-71	MC4558C
	TRANSISTORS	
Q501, 502, 701, 702, 715, 716	2-404-111-35-1	2SK24GR F.E.T
⚠ Q503	2-401-112-21	KTB1366
⚠ Q504	2-402-153-21	KTD2058
Q505, 507, 703, 704, 707, 708, 713, 714, 719, 720	2-402-180-35	2SC1571G
Q506, 508, 705, 706, 709, 710, 711, 712 717, 718	2-400-157-35	2SA929G
Q201, 403, 602	2-402-111-25	KTC3198Y
Q402	2-402-114-25	KTC3203Y
Q101, 202, 401	2-400-108-25	KTA1271Y
Q203	2-402-152-15	MP5A25(DARINGTON)
Q725	2-406-107-15	KSR2001
Q726	2-406-109-15	KSR1003
Q601	2-406-106-15	KRA103M
Q721, 722, 723, 724	2-406-154-15	KTC2878A
	DIODES	
⚠ D501, 502, 503, 504	2-413-581-65-1	1N4003L
D101, 402, 403	2-410-179-95	1SS133
⚠ D505, 506	2-421-062-45	ZENER 1N73A 6.2V
	MISCELLANEOUS	
X401	2-138-166-01	6MHZ, X-TALIat IC401(HD4074008S)
	OR 2-138-167-01	3MHZ, X-TALIat IC401(LE1043, HMCS408AC)
X601	2-138-181-01	33.8688MHZSRDI
WA101, 301, 302	2-168-121-01	2.5M/M, 2P, NKCC21
WA104, 403	2-168-124-01	2.5M/M, 5P, NICC-024-0
WA102	2-168-424-01	STRAIGHT TYPE, 8P, 2M/M
WA401, 402	2-168-101-01	2P, 2MM
WA201	2-168-360-01	00-8283-0412-0000 4P, 2M/M
WA103	2-168-445-01	4P, 2M/M, RED
WA202	2-168-446-01	4P, 2M/M, YELLOW
WA501	2-168-469-01	13P, 52303-1311, BLACK
CN401, 402	2-159-979-01	2P, 2M/M, 350M/M
L101	1-034-100-35	10UH, AL0307MM9 ±10%
HS501	3-710-702-03	40MM, AL
JAC701	2-155-617-01	GOLD WHITE, RED, P.14
	PCB-2 CONTROL P.C. BOARD	
	RESISTORS	
R406	1-118-331-25	330Ω 1/4W, ±5%
	L.E. DIOED	
D401	2-419-493-45	R34MC F02, F=4MM
	SWITCH	
SW401	2-208-999-01	177-620-002-000, KHH-10910

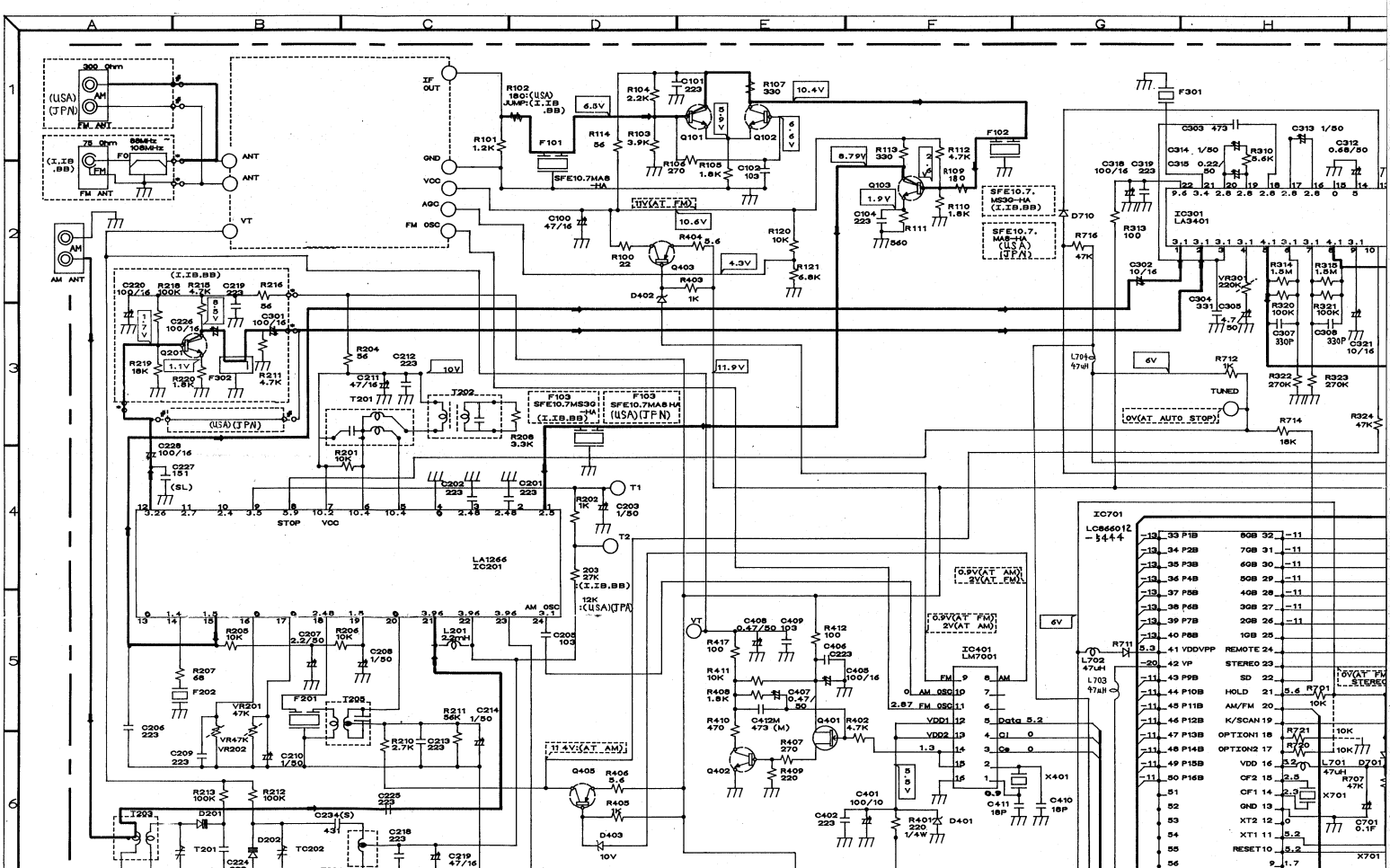
PACKING DRAWING

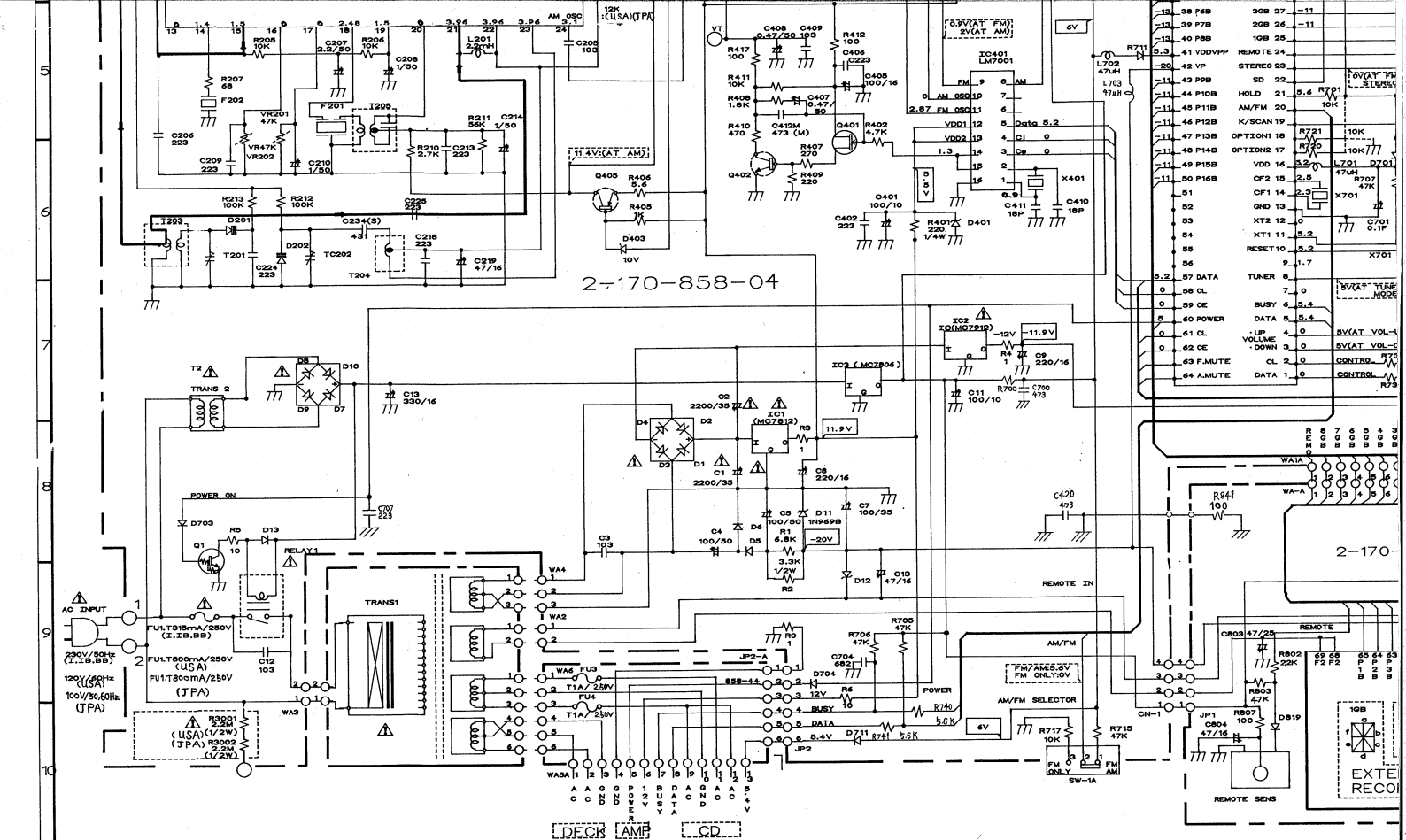
CDP : CD-300/500

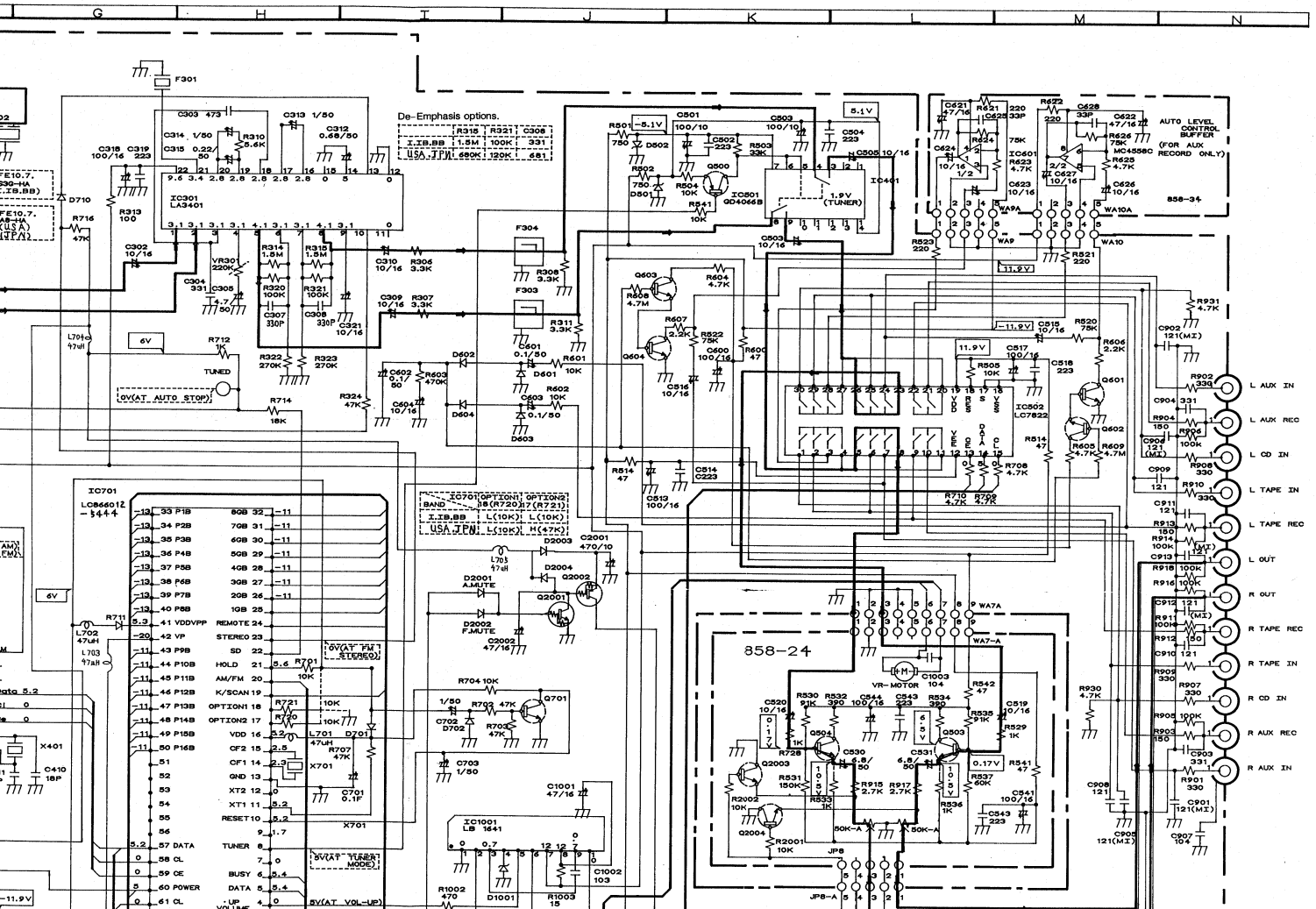


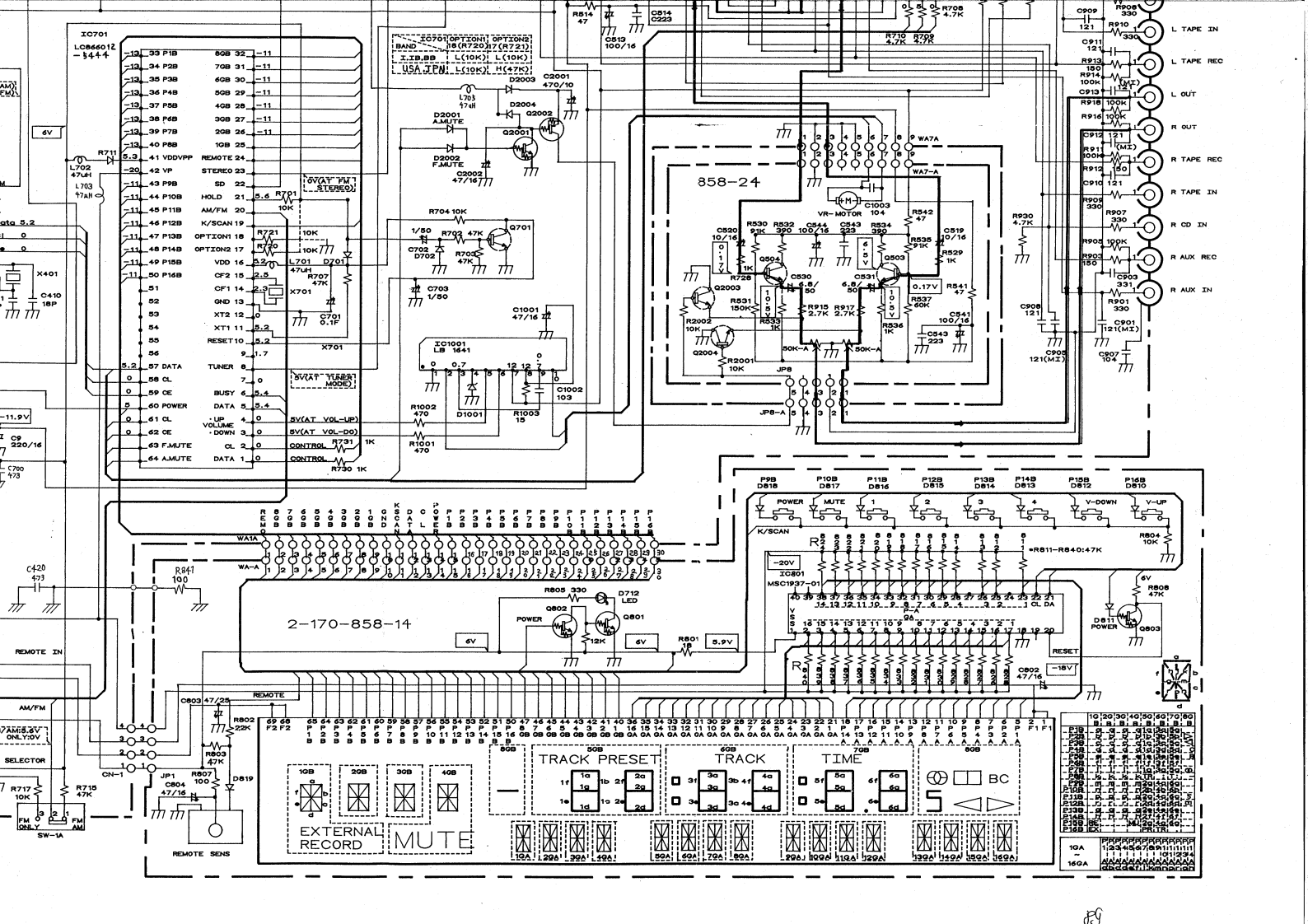
NO	PARTS NAME	PARTS NO.	Q'TY
1	PAD BOTTOM	3-819-811-01	1
2	PIN CORD	2-212-140-01	1
3	SHEET POLY	3-324-029-01	1
4	STICKER SET	3-819-817-01	1
5	INNER LID	3-324-019-01	1

SCHEMATIC DIAGRAM (TUNER)

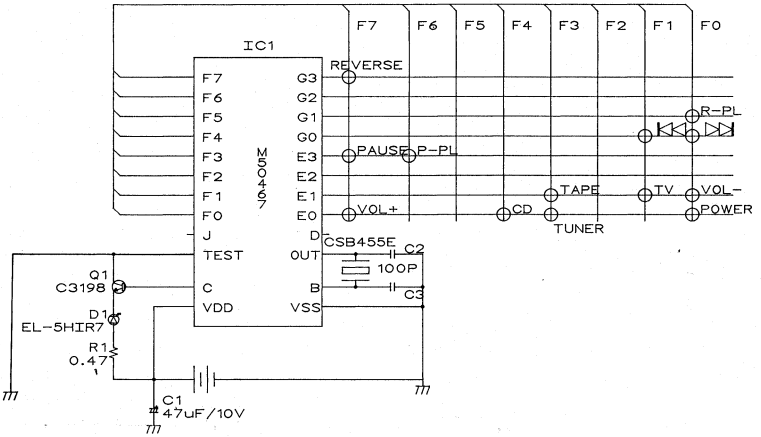


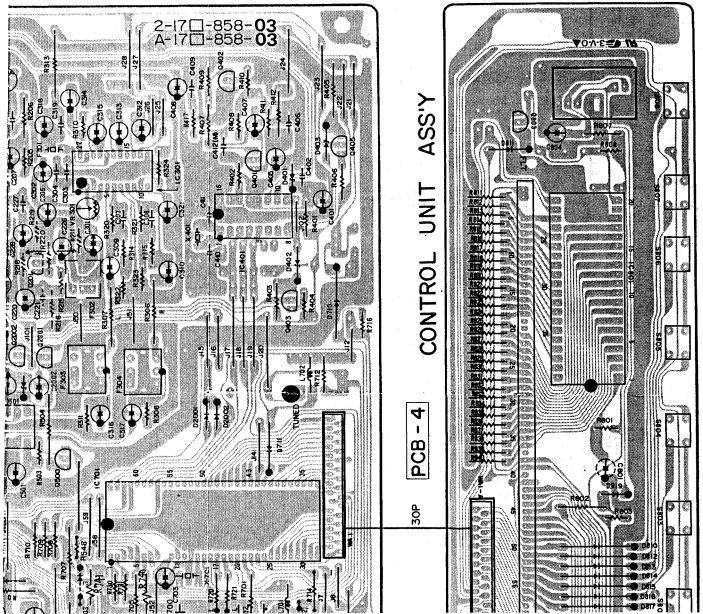

2-170-858-04
DECK
AMP
CD
AC INPUT
TRANS 2
TRANS1
POWER ON
RELAY1
REMOTE IN
AM/FM
REMOTE
REMOTE SENS
AM/FM SELECTOR
POWER
IC401 LM7001
IC2 (MC7912)
IC3 (MC7806)
IC1 (MC7812)
X401
X701
CN-1
SW-1A
JP1
JP2
2-170-


G
H
I
J
K
L
M
N
F301
IC301 LA3401
IC701 LC866012 -5444
IC1001 LB 1641
IC501 GD4066B
IC1401
IC502 LC7822
IC601 MC4558C
Q500
Q501
Q502
Q503
Q504
Q601
Q602
Q603
Q604
Q701
Q702
Q703
Q704
Q2001
Q2002
Q2003
Q2004
D601
D602
D603
D604
D701
D702
D703
D704
D2001
D2002
D2003
D2004
D1001
X401
X701
858-24
858-34
AUTO LEVEL CONTROL BUFFER (FOR AUX RECORD ONLY)
De-Emphasis options.
USA JPN
L AUX IN
L AUX REC
L CD IN
L TAPE IN
L TAPE REC
L OUT
R OUT
R TAPE REC
R TAPE IN
R CD IN
R AUX REC
R AUX IN
TUNED
VR-MOTOR
JP8
JP8-A
WA7
WA7-A
WA8
WA10
WA10A

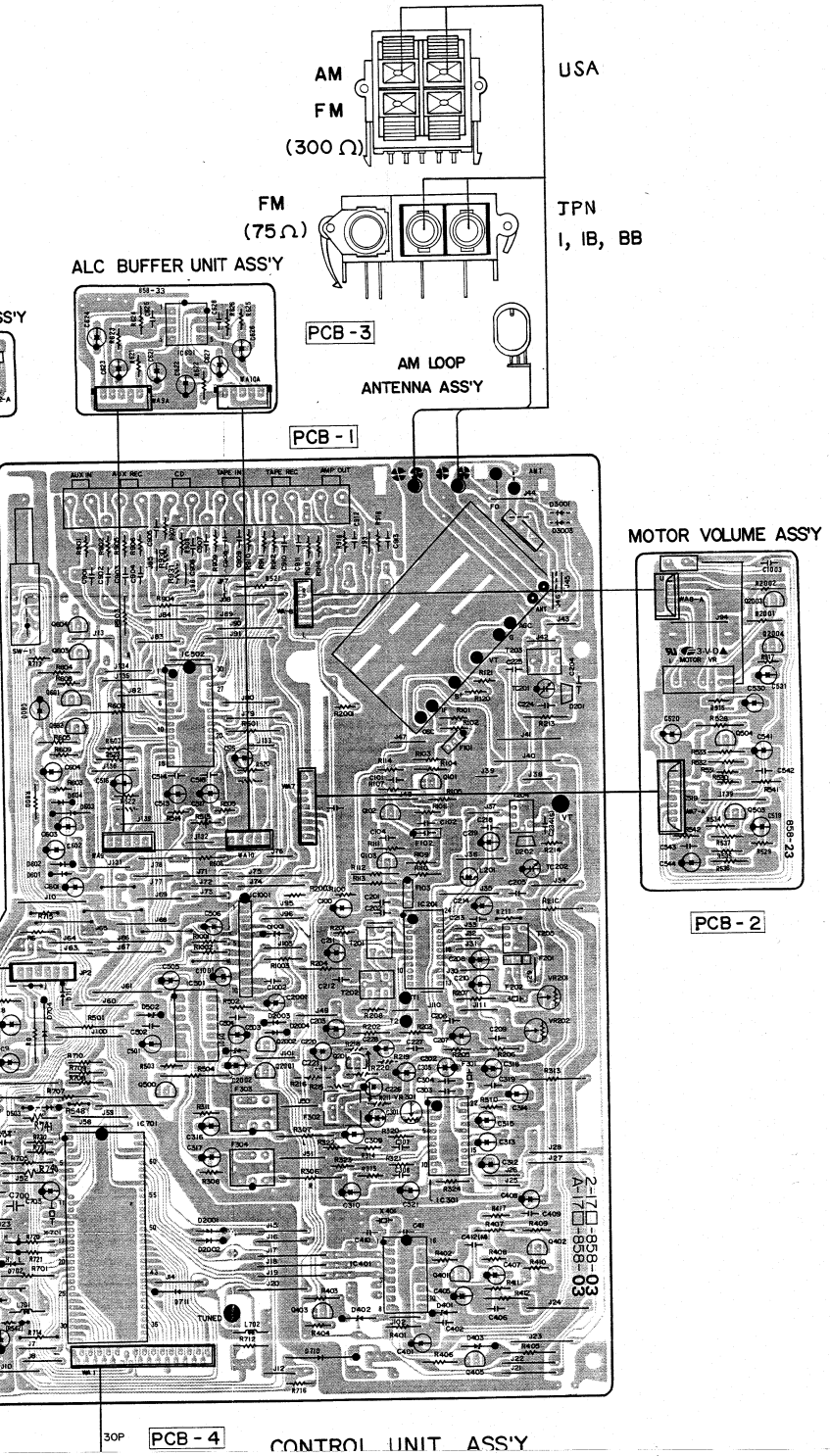

IC701
LC866012
-5444
858-24
2-170-858-14
REMOTE IN
REMOTE
AM/FM
SELECTOR
SW-1A
REMOTE SENS
EXTERNAL RECORD
MUTE
TRACK PRESET
TRACK
TIME
BC
L TAPE IN
L TAPE REC
L OUT
R OUT
R TAPE REC
R TAPE IN
R CD IN
R AUX REC
R AUX IN
POWER
MUTE
V-DOWN
V-UP
RESET
IC801
MSC1937-01
IC1001
LB 1641
VR-MOTOR
WA7-A
JP8
JP8-A

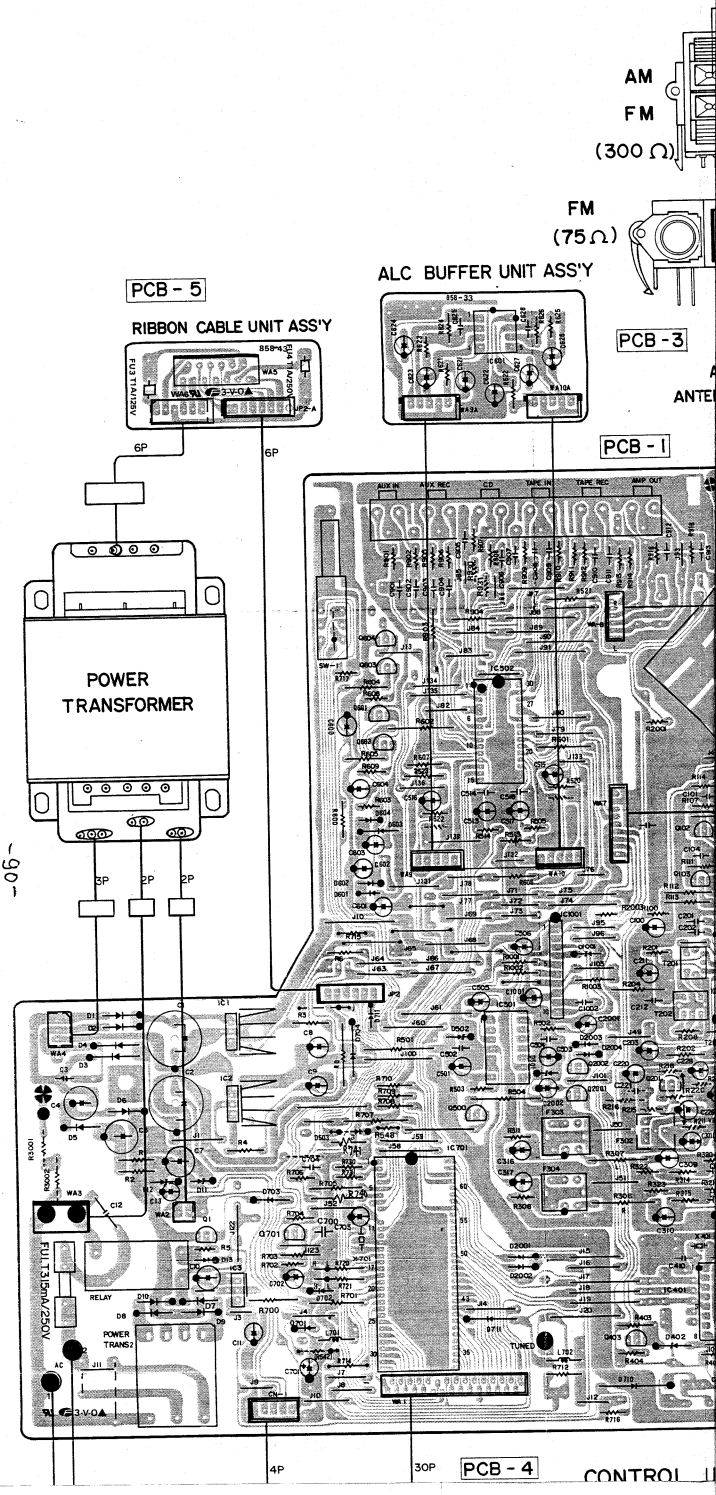
SCHEMATIC DIAGRAM (REMOTE CONTROL)



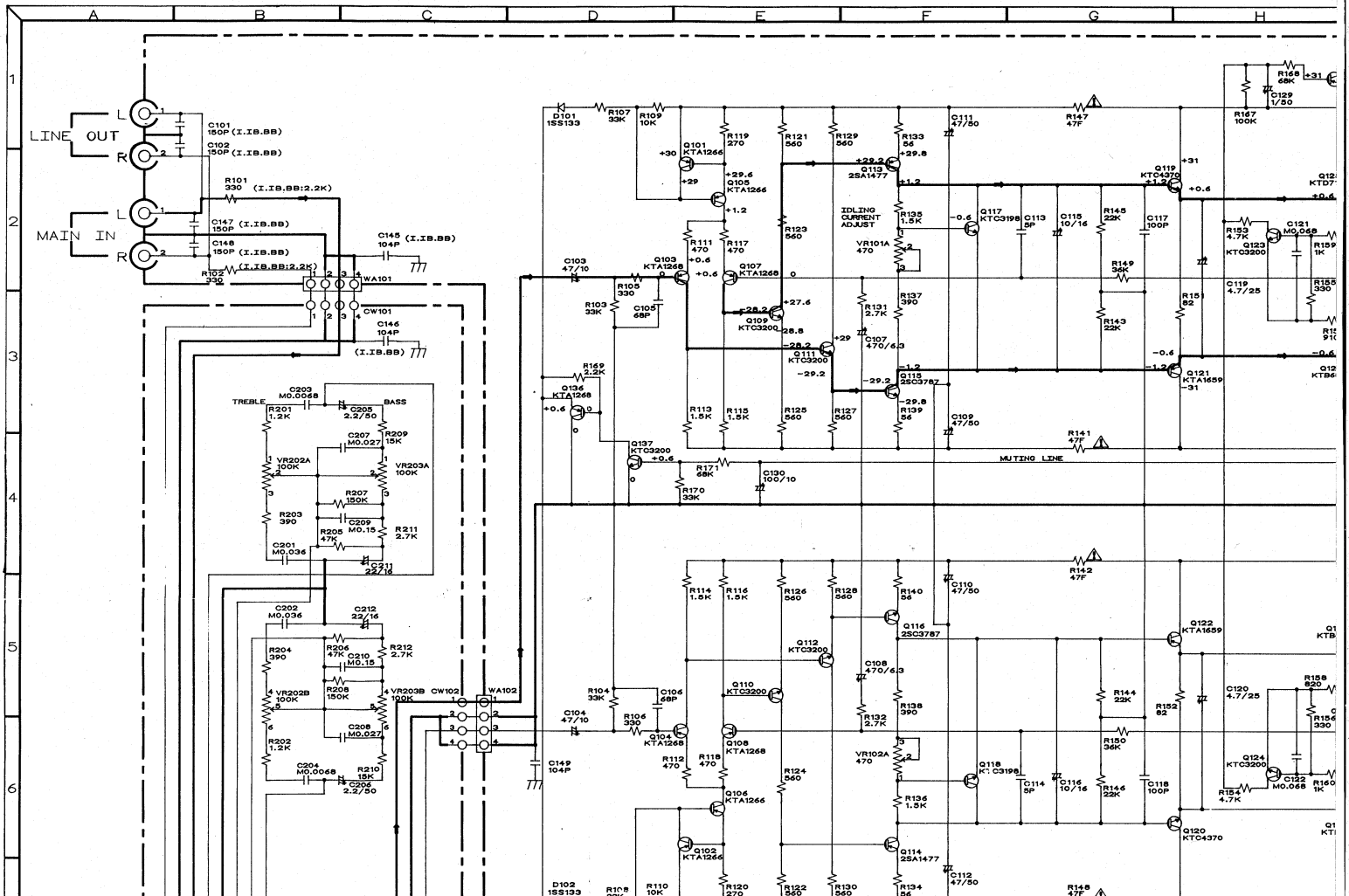


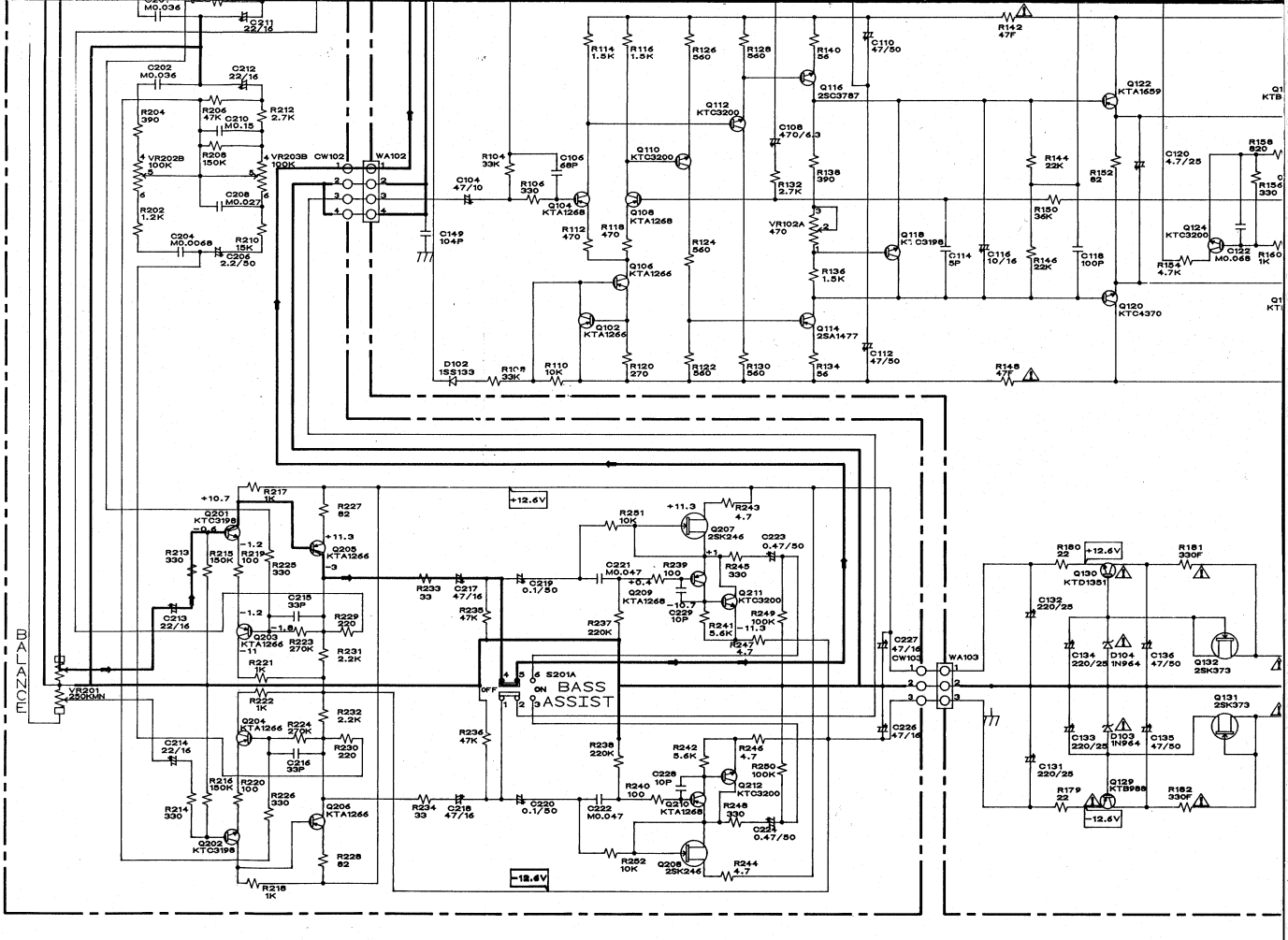
CONTROL UN
PCB - 4
30P
4P
FUI T315mA/250V
POWER TRANS21
RELAY
AC 120V 60HZ (USA)
AC 230V 50HZ (I, IB, BB)
AC 100V 50 HZ, 60HZ (JPN)

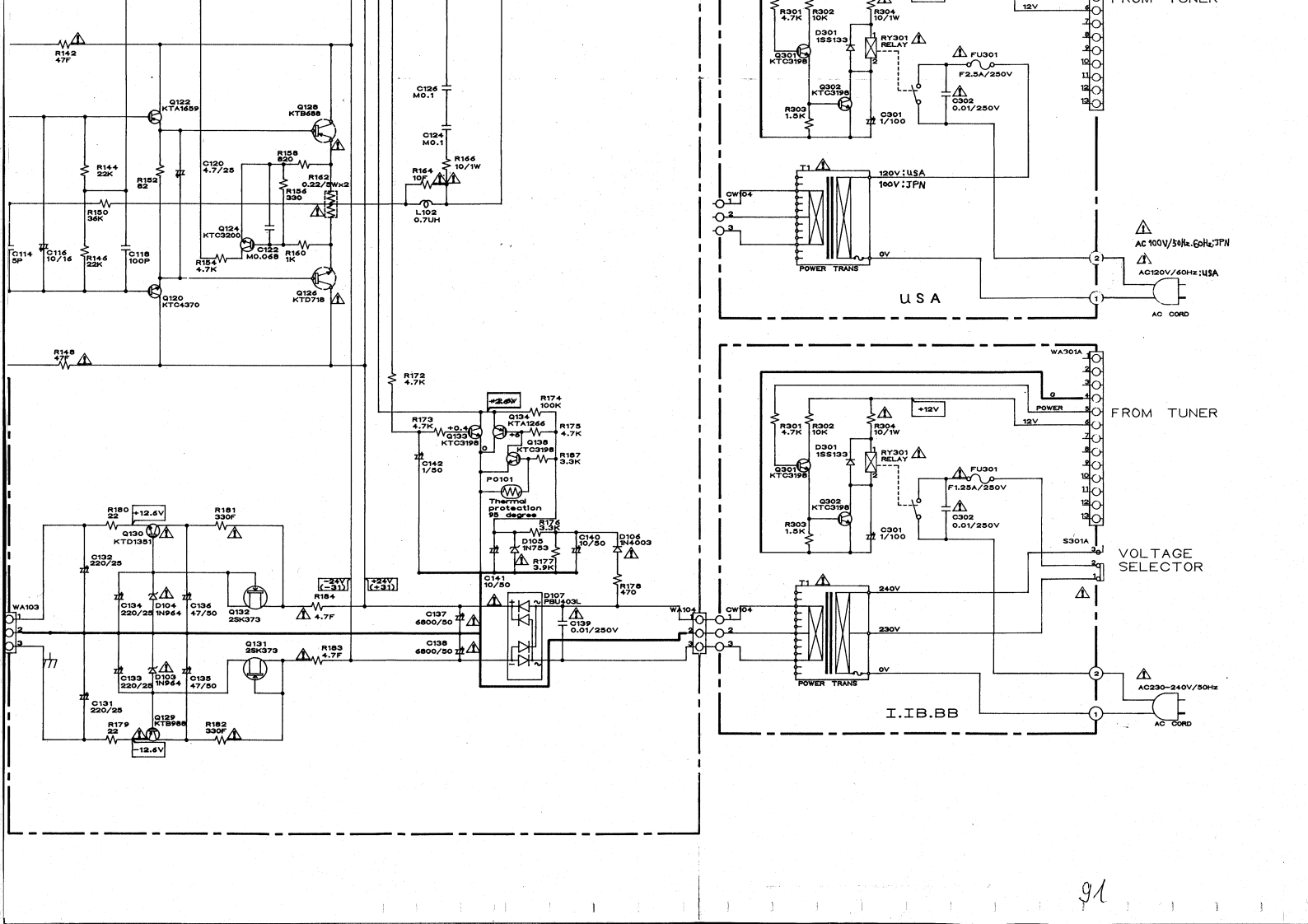

AM
FM
(300 Ω)
USA
FM
(75 Ω)
JPN
I, IB, BB
ALC BUFFER UNIT ASS'Y
PCB - 3
AM LOOP
ANTENNA ASS'Y
PCB - 1
MOTOR VOLUME ASS'Y
PCB - 2
30P
PCB - 4
CONTROL UNIT ASS'Y
2-17□-858-03
A-17□-858-03

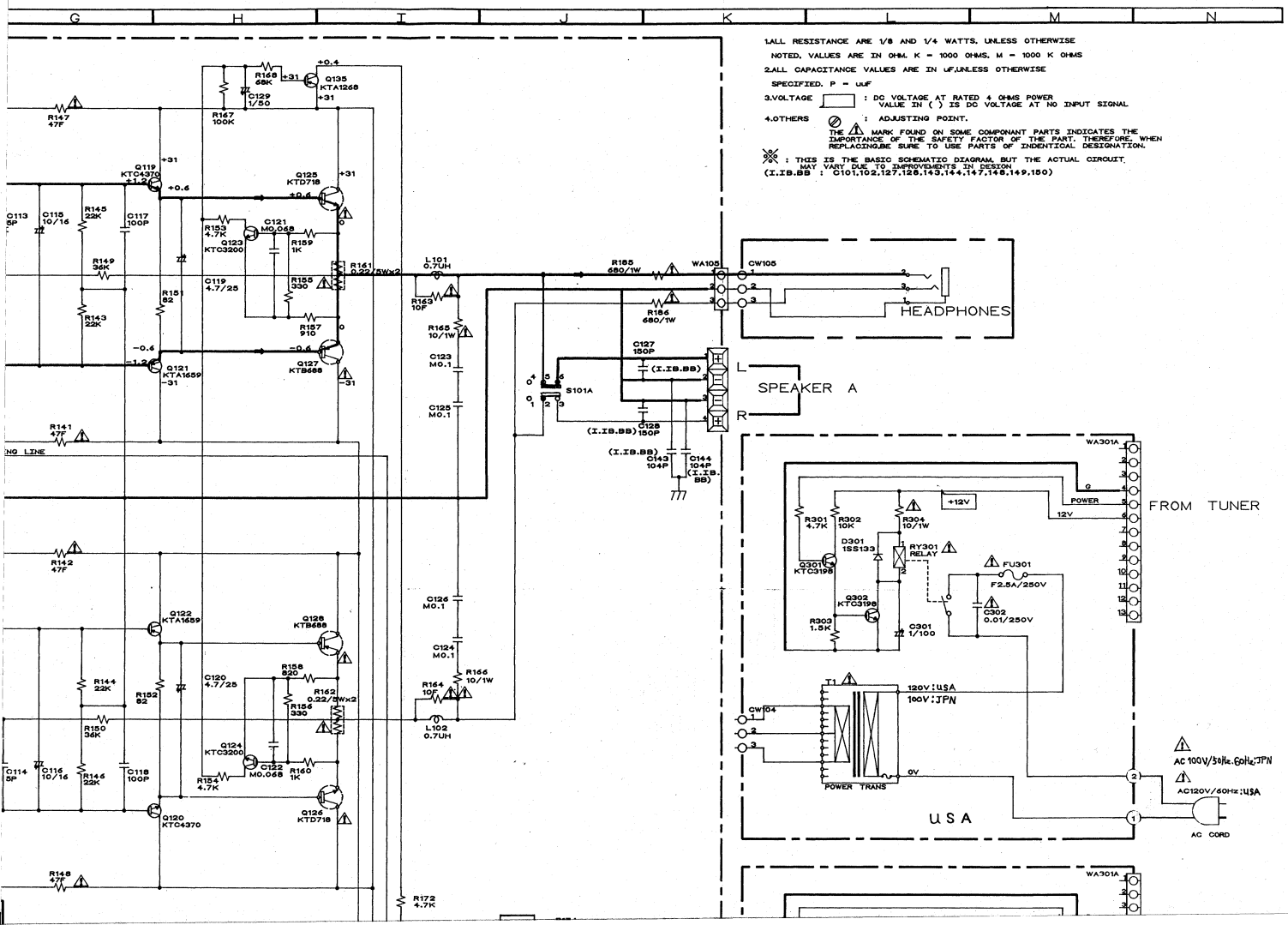

AM
FM
(300 Ω)
FM
(75 Ω)
ALC BUFFER UNIT ASS'Y
PCB - 5
RIBBON CABLE UNIT ASS'Y
PCB - 3
PCB - 1
6P
6P
POWER
TRANSFORMER
3P
2P
2P
FU1 T315mA/250V
RELAY
POWER
TRANS2
TUNED
4P
30P
PCB - 4
CONTROL
- 90 -

SCHEMATIC DIAGRAM (A300)




BALANCE
VR201 250KMN
BASS
ASSIST
S201A
OFF
ON
+12.6V
-12.6V
WA102
WA103
CW102
CW103
Q201 KTC3198
Q202 KTC3198
Q203 KTA1266
Q204 KTA1266
Q205 KTA1266
Q206 KTA1266
Q207 2SK246
Q208 2SK246
Q209 KTA1268
Q210 KTA1268
Q211 KTC3200
Q212 KTC3200
Q130 KTD1351
Q131 2SK373
Q132 2SK373
Q129 KTB985
Q102 KTA1266
Q104 KTA1268
Q106 KTA1266
Q108 KTA1268
Q110 KTC3200
Q112 KTC3200
Q114 2SA1477
Q116 2SC3787
Q118 KTC3198
Q120 KTC4370
Q122 KTA1659
Q124 KTC3200
D102 1SS133
D103 1N264
D104 1N264


R142 47F
Q122 KTA1659
Q126 KTB688
C126 M0.1
C124 M0.1
R144 22K
R152 82
C120 4.7/25
R158 620
R162 0.22/2W×2
R156 330
R164 10F
R166 10/1W
L102 0.7UH
R150 36K
Q124 KTC3200
C122 M0.068
R160 1K
R154 4.7K
C114 5P
C116 10/16
R146 22K
C118 100P
Q120 KTC4370
Q126 KTD718
R148 47
R172 4.7K
+2.6V
R174 100K
R173 4.7K
±0.4
Q134 KTA1266
R175 4.7K
+8
Q133 KTC3198
Q138 KTC3198
R187 3.3K
C142 1/50
P0101
Thermal protection 95 degree
R176 3.3K
C140 10/50
D106 1N4003
D105 1N753
R177 3.9K
R178 470
C141 10/50
D107 PBU403L
C139 0.01/250V
R180 22
+12.6V
Q130 KTD1351
R181 330F
C132 220/25
-24V (-31)
+24V (+31)
WA103
C134 220/25
D104 1N964
C136 47/50
Q132 2SK373
R184 4.7F
C137 6800/50
WA104
C138 6800/50
Q131 2SK373
R183 4.7F
C133 220/25
D103 1N964
C135 47/50
C131 220/25
Q129 KTB988
R179 22
-12.6V
R182 330F
R301 4.7K
R302 10K
R304 10/1W
+12V
D301 1SS133
RY301 RELAY
FU301
F2.5A/250V
Q301 KTC3198
Q302 KTC3198
C302 0.01/250V
R303 1.5K
C301 1/100
T1
120V:USA
100V:JPN
CW104
POWER TRANS
0V
AC 100V/50Hz,60Hz:JPN
AC120V/60Hz:USA
AC CORD
USA
FROM TUNER
WA301A
POWER
12V
F1.25A/250V
S301A
VOLTAGE SELECTOR
240V
230V
AC230-240V/50Hz
I.IB.BB


G H I J K L M N
1.ALL RESISTANCE ARE 1/8 AND 1/4 WATTS. UNLESS OTHERWISE NOTED, VALUES ARE IN OHM. K = 1000 OHMS. M = 1000 K OHMS
2.ALL CAPACITANCE VALUES ARE IN uF,UNLESS OTHERWISE SPECIFIED. P = uuF
3.VOLTAGE : DC VOLTAGE AT RATED 4 OHMS POWER VALUE IN ( ) IS DC VOLTAGE AT NO INPUT SIGNAL
4.OTHERS : ADJUSTING POINT.
THE ⚠ MARK FOUND ON SOME COMPONANT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE PART. THEREFORE, WHEN REPLACING,BE SURE TO USE PARTS OF INDENTICAL DESIGNATION.
※ : THIS IS THE BASIC SCHEMATIC DIAGRAM, BUT THE ACTUAL CIRCUIT MAY VARY DUE TO IMPROVEMENTS IN DESIGN.
(I.IB.BB : C101,102,127,128,143,144,147,148,149,150)
HEADPHONES
SPEAKER A
L
R
FROM TUNER
USA
POWER TRANS
AC CORD
AC 100V/50Hz.60Hz:JPN
AC120V/60Hz:USA
120V:USA
100V:JPN
POWER
12V
+12V
RELAY
F2.5A/250V
S101A
Q119 KTC4370
Q125 KTD718
Q123 KTC3200
Q121 KTA1659
Q127 KTB688
Q122 KTA1659
Q126 KTB688
Q124 KTC3200
Q120 KTC4370
Q126 KTD718
Q135 KTA1268
Q301 KTC3198
Q302 KTC3198
D301 1SS133
RY301 RELAY
FU301
T1
CW105
CW104
WA105
WA301A
R147 47F
R147 100K
R168 68K
C129 1/50
C113 5P
C115 10/16
R145 22K
C117 100P
R149 36K
R143 22K
R153 4.7K
C121 M0.068
R159 1K
R161 0.22/5Wx2
R151 82
C119 4.7/25
R155 330
R157 910
L101 0.7UH
R163 10F
R165 10/1W
C123 M0.1
C125 M0.1
R185 680/1W
R184 680/1W
C127 150P
C128 150P
C143 104P
C144 104P
R141 47F
R142 47F
R144 22K
R152 82
R150 36K
C114 5P
C116 10/16
R146 22K
C118 100P
C120 4.7/25
R158 820
R162 0.22/5Wx2
R156 330
R154 4.7K
C122 M0.068
R160 1K
C126 M0.1
C124 M0.1
R164 10F
R166 10/1W
L102 0.7UH
R148 47F
R172 4.7K
R301 4.7K
R302 10K
R304 10/1W
R303 1.5K
C301 1/100
C302 0.01/250V
R169 10K
R170 10K
R171 10K
R173 10K
R174 10K
R175 10K
R176 10K
R177 10K
R178 10K
R179 10K
R180 10K
R181 10K
R182 10K
R183 10K
R186 10K
R187 10K
R188 10K
R189 10K
R190 10K
R191 10K
R192 10K
R193 10K
R194 10K
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R197 10K
R198 10K
R199 10K
R200 10K
R201 10K
R202 10K
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R218 10K
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R221 10K
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R227 10K
R228 10K
R229 10K
R230 10K
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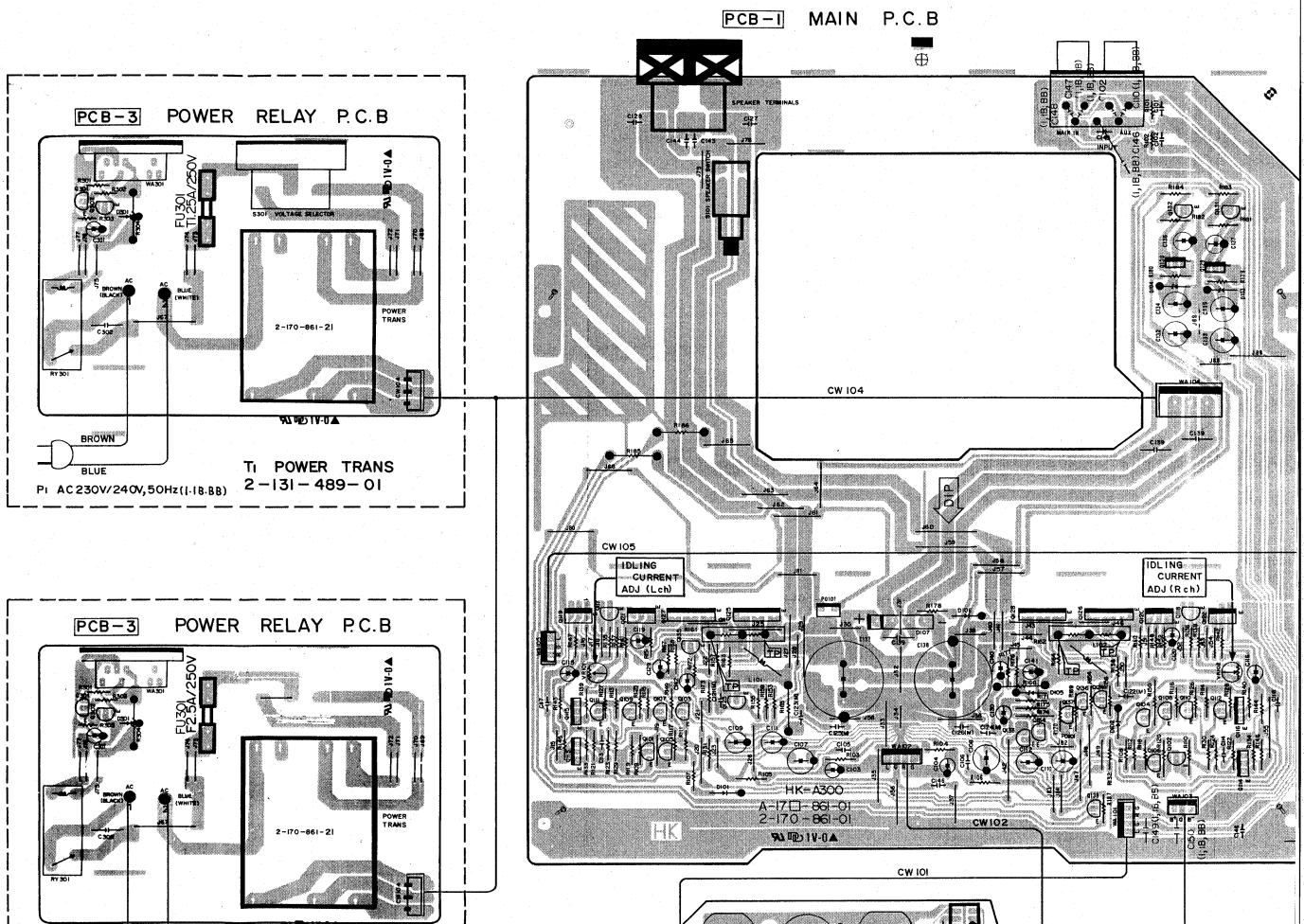
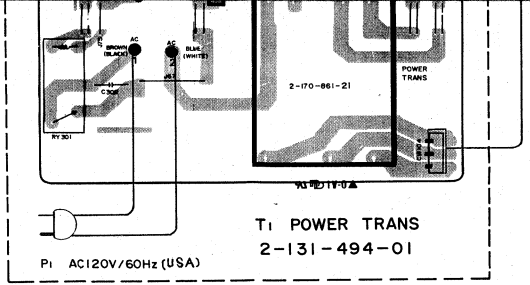
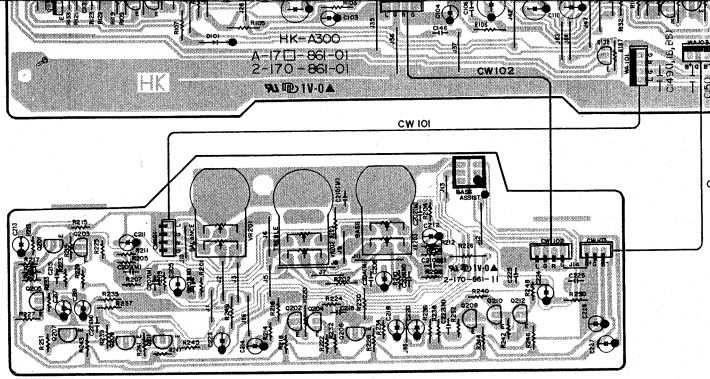
R272 10K
R273 10K
R274 10K
R275 10K
R276 10K
R277 10K
R278 10K
R279 10K
R280 10K
R281 10K
R282 10K
R283 10K
R284 10K
R285 10K
R286 10K
R287 10K
R288 10K
R289 10K
R290 10K
R291 10K
R292 10K
R293 10K
R294 10K
R295 10K
R296 10K
R297 10K
R298 10K
R299 10K
R300 10K

A-300


PCB-1 MAIN P.C.B
PCB-3 POWER RELAY P.C.B
FU301 T1.25A/250V
S301 VOLTAGE SELECTOR
2-170-861-21
POWER TRANS
BROWN
BLUE
T1 POWER TRANS
2-131-489-01
P1 AC230V/240V,50Hz(1-18-88)
PCB-3 POWER RELAY P.C.B
FU301 F2.5A/250V
2-170-861-21
POWER TRANS
SPEAKER TERMINALS
S301 SPEAKER SWITCH
CW 104
CW 105
CW 102
CW 101
IDLING CURRENT ADJ (Lch)
IDLING CURRENT ADJ (Rch)
DIP
HK=A300
A-17□-861-01
2-170-861-01
HK
1V-0▲

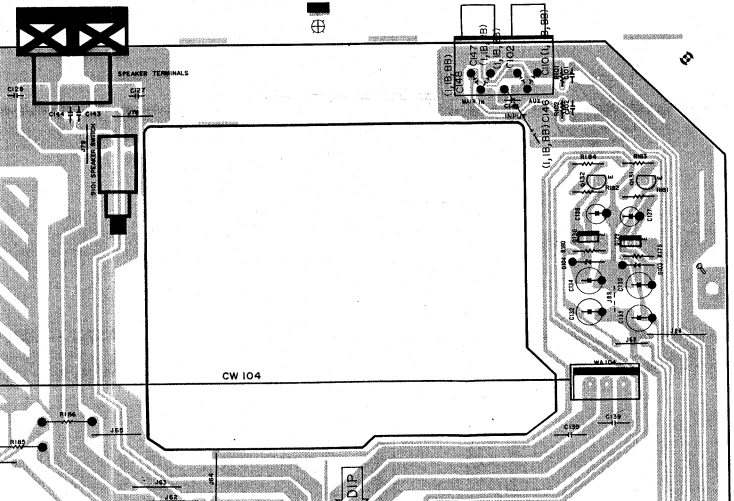


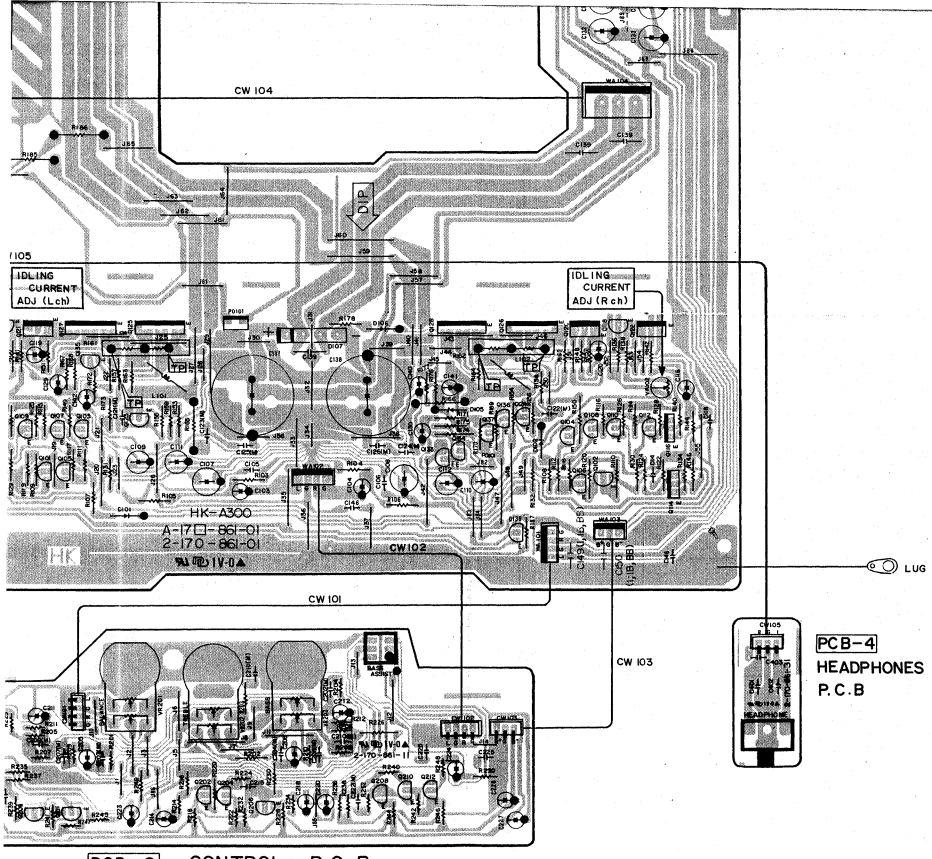


PCB-2 CONTROL P.C.B

92

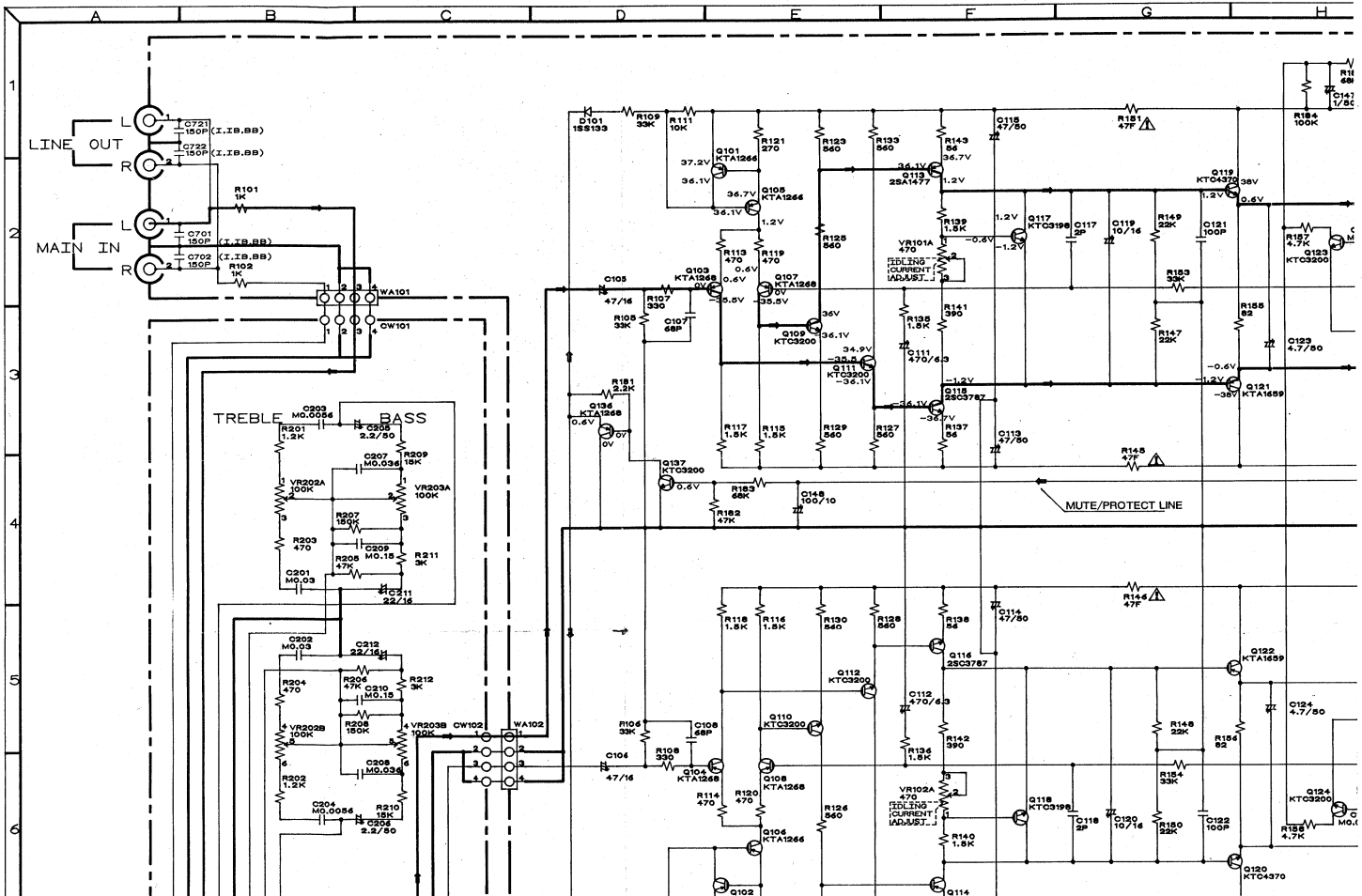
PCB-1 MAIN P.C.B

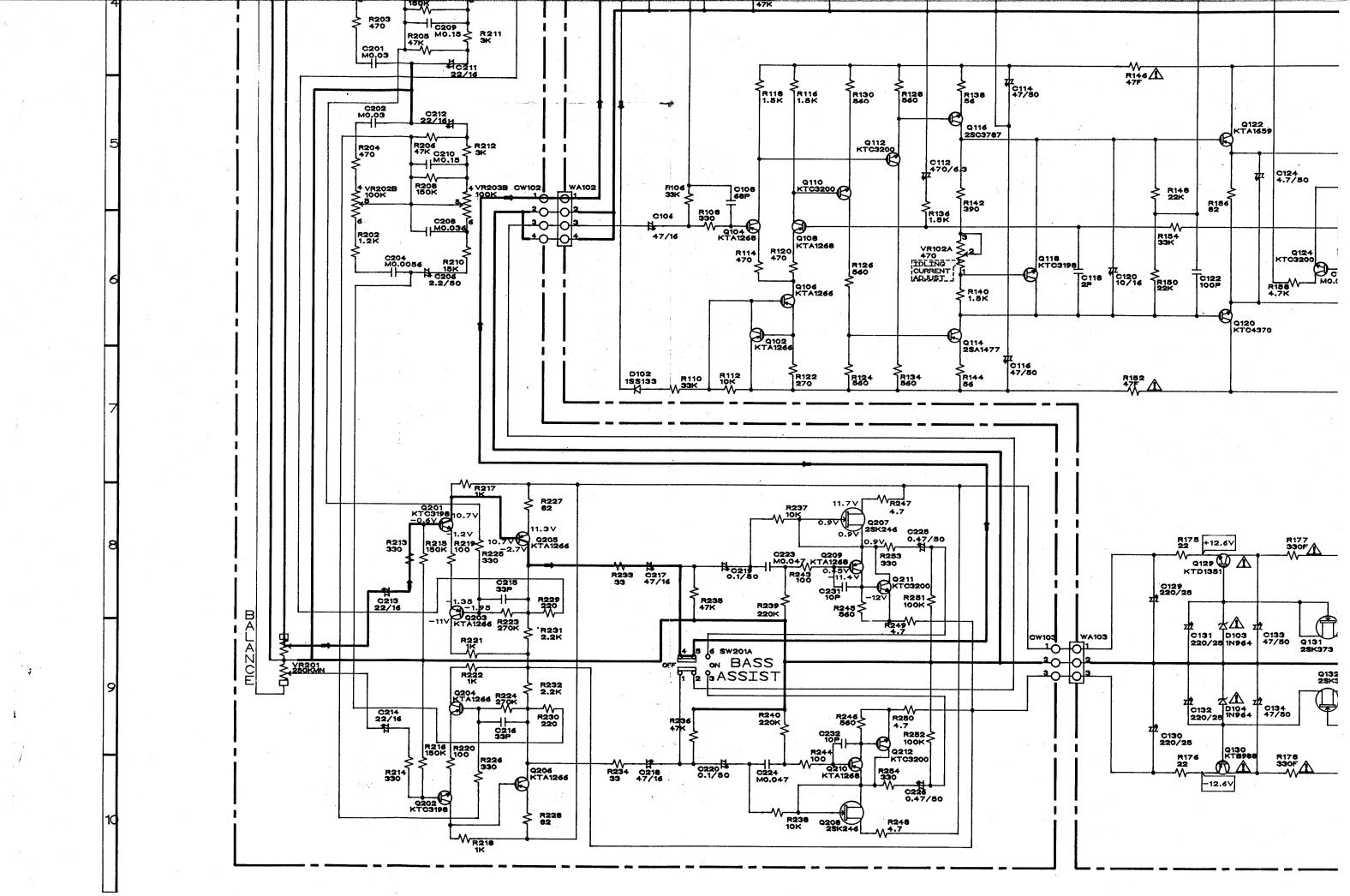


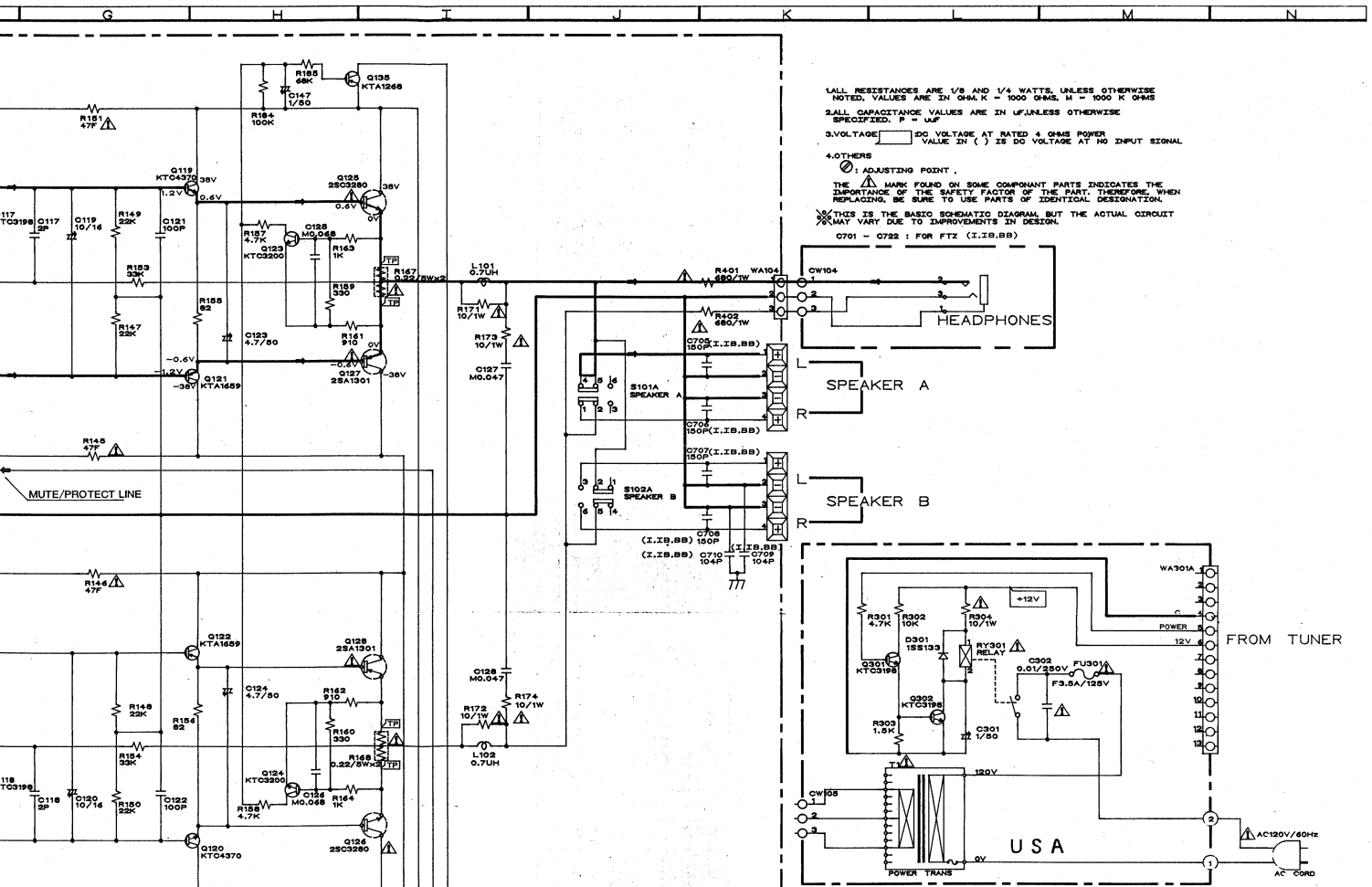


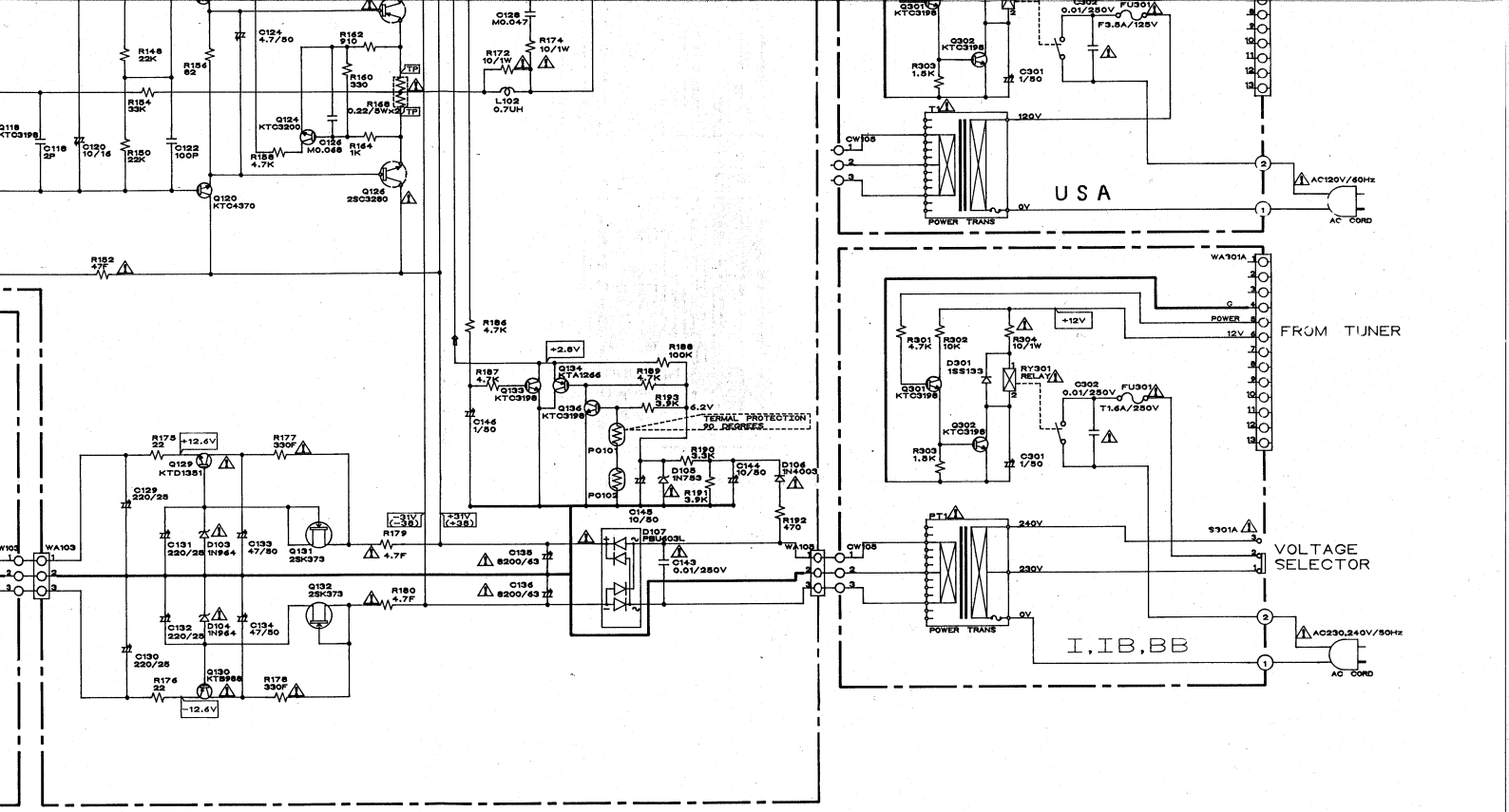
PCB-2 CONTROL P.C.B

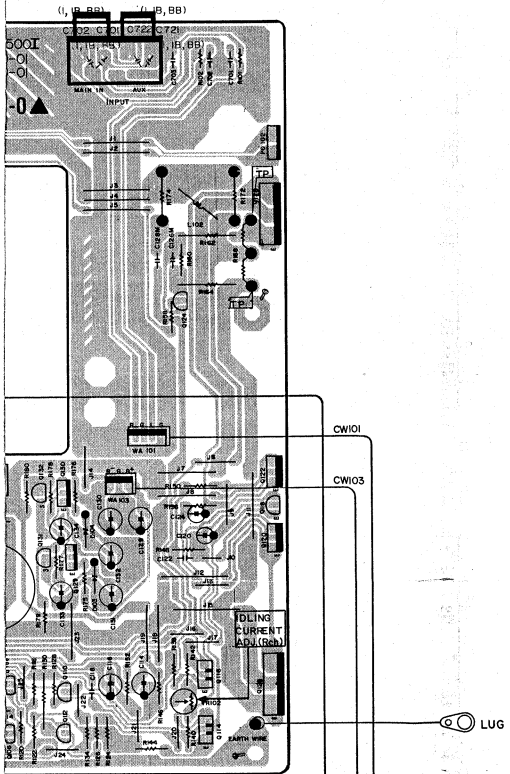
SCHEMATIC DIAGRAM (A500)

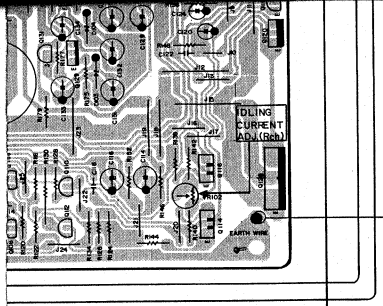



BALANCE
BASS
ASSIST
SW201A
CW102
WA102
CW103
WA103
VR201 200KMN
VR202B 100K
VR203B 100K
VR102A 470
CURRENT ADJUST
+12.6V
-12.6V

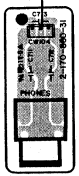

G
H
I
J
K
L
M
N
1.ALL RESISTANCES ARE 1/8 AND 1/4 WATTS, UNLESS OTHERWISE NOTED. VALUES ARE IN OHM. K = 1000 OHMS, M = 1000 K OHMS
2.ALL CAPACITANCE VALUES ARE IN UF,UNLESS OTHERWISE SPECIFIED. P = UUF
3.VOLTAGE: DC VOLTAGE AT RATED 4 OHMS POWER. VALUE IN ( ) IS DC VOLTAGE AT NO INPUT SIGNAL
4.OTHERS
: ADJUSTING POINT.
THE MARK FOUND ON SOME COMPONANT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE PART. THEREFORE, WHEN REPLACING, BE SURE TO USE PARTS OF IDENTICAL DESIGNATION.
THIS IS THE BASIC SCHEMATIC DIAGRAM, BUT THE ACTUAL CIRCUIT MAY VARY DUE TO IMPROVEMENTS IN DESIGN.
C701 - C722 : FOR FTZ (I,IB,BB)
HEADPHONES
SPEAKER A
SPEAKER B
MUTE/PROTECT LINE
FROM TUNER
USA
AC CORD
POWER TRANS
S101A SPEAKER A
S102A SPEAKER B
Q119 KTC4370
Q125 2SC3280
Q123 KTC3200
Q121 KTA1659
Q127 2SA1301
Q135 KTA1268
Q122 KTA1659
Q128 2SA1301
Q124 KTC3200
Q120 KTC4370
Q126 2SC3280
Q301 KTC3198
Q302 KTC3198
D301 1SS133
RY301 RELAY
FU301 F3.5A/125V
CW104
CW105
WA104
WA301A


USA
I,IB,BB
FROM TUNER
VOLTAGE SELECTOR
POWER TRANS
AC CORD
AC120V/60Hz
AC230,240V/50Hz
THERMAL PROTECTION
TO DRIVERS
+12.6V
-12.6V
+2.8V
+12V
-31V (-38)
+31V (+38)
WA101
WA102
WA103
WA104
WA105
WA106
WA107
WA108
CW105
FU301
FU302
F3.5A/125V
T1.6A/250V
RY301
RELAY
S301A
PT1
240V
230V
120V
0V


CW101
CW103
LUG
IDLING CURRENT ADJ (Rch)
EARTH WIRE
MAIN IN
AUX
INPUT
TP
WA 101

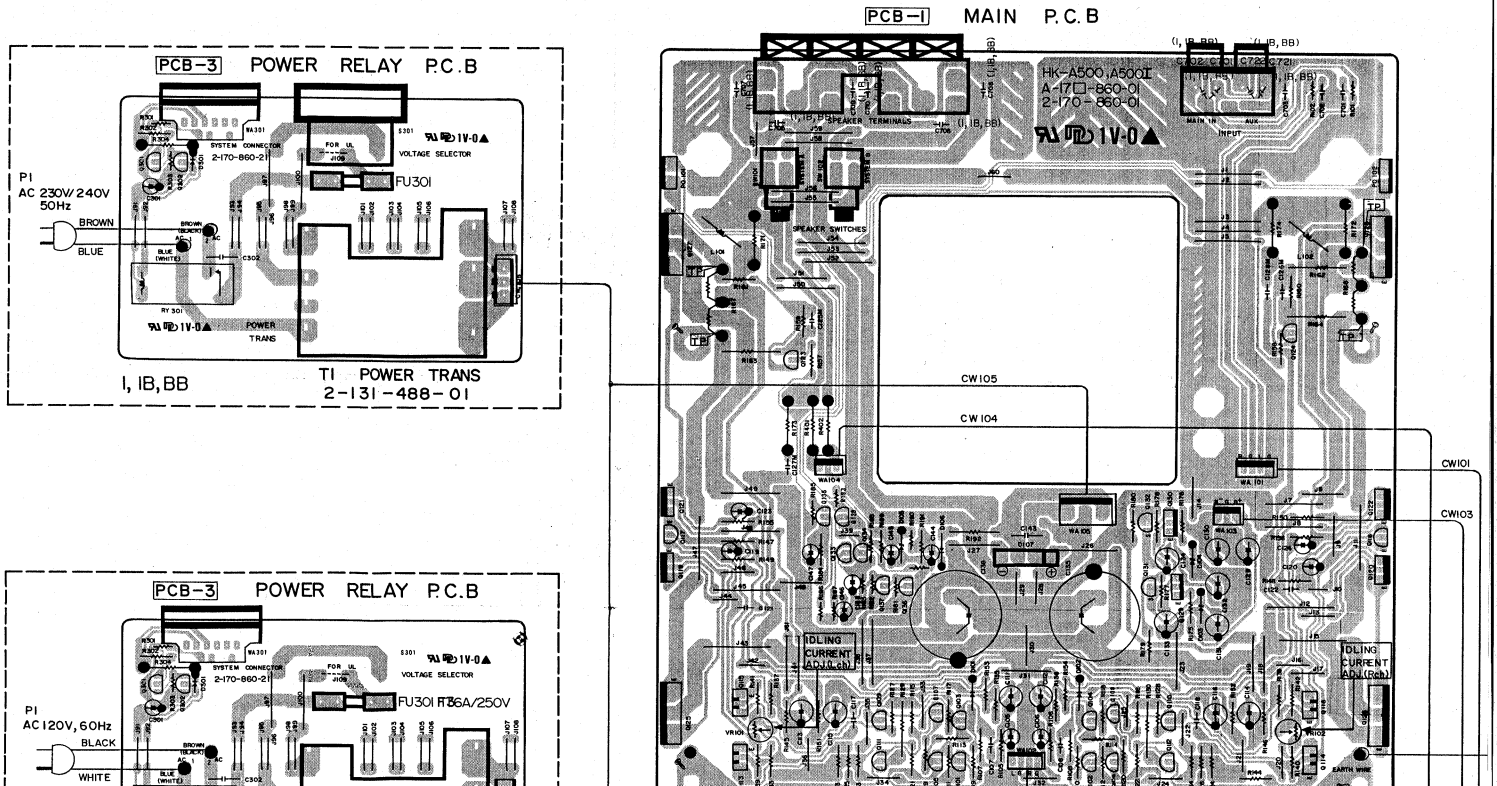


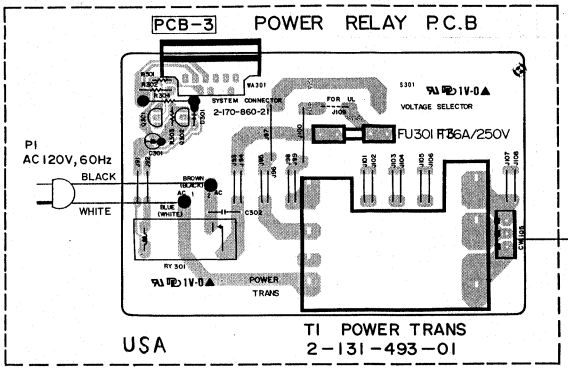
LUG

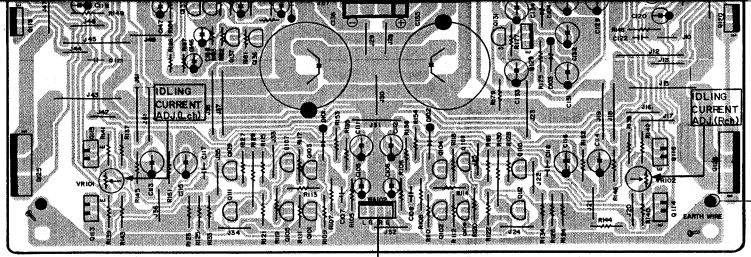


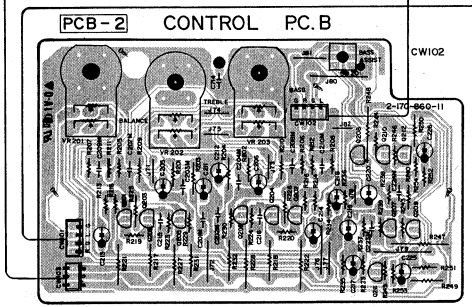
PCB-4
HEADPHONES
P. C. B

A-500

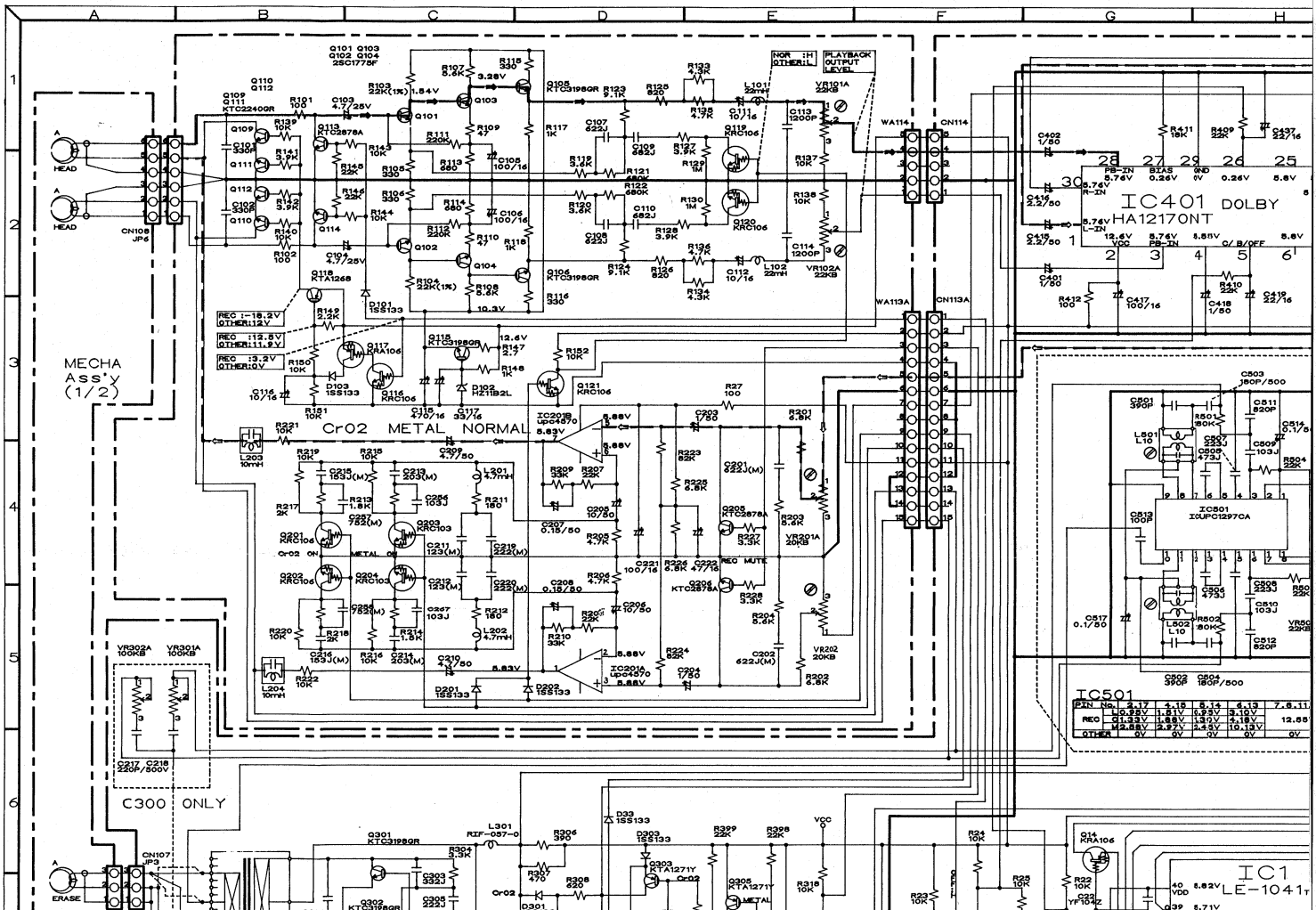

PCB-3 POWER RELAY P.C.B
PI
AC 230V/240V
50Hz
BROWN
BLUE
SYSTEM CONNECTOR
2-170-860-21
FOR UL
VOLTAGE SELECTOR
FU301
POWER
TRANS
I, IB, BB
TI POWER TRANS
2-131-488-01
PCB-3 POWER RELAY P.C.B
PI
AC 120V, 60Hz
BLACK
WHITE
FU301 T6A/250V
PCB-1 MAIN P.C.B
HK-A500, A500Z
A-17□-860-01
2-170-860-01
SPEAKER TERMINALS
SPEAKER SWITCHES
MAIN IN
AUX
INPUT
CW105
CW104
CW101
CW103
IDLING CURRENT ADJ (Ch)
IDLING CURRENT ADJ (Rch)
EARTH WIRE

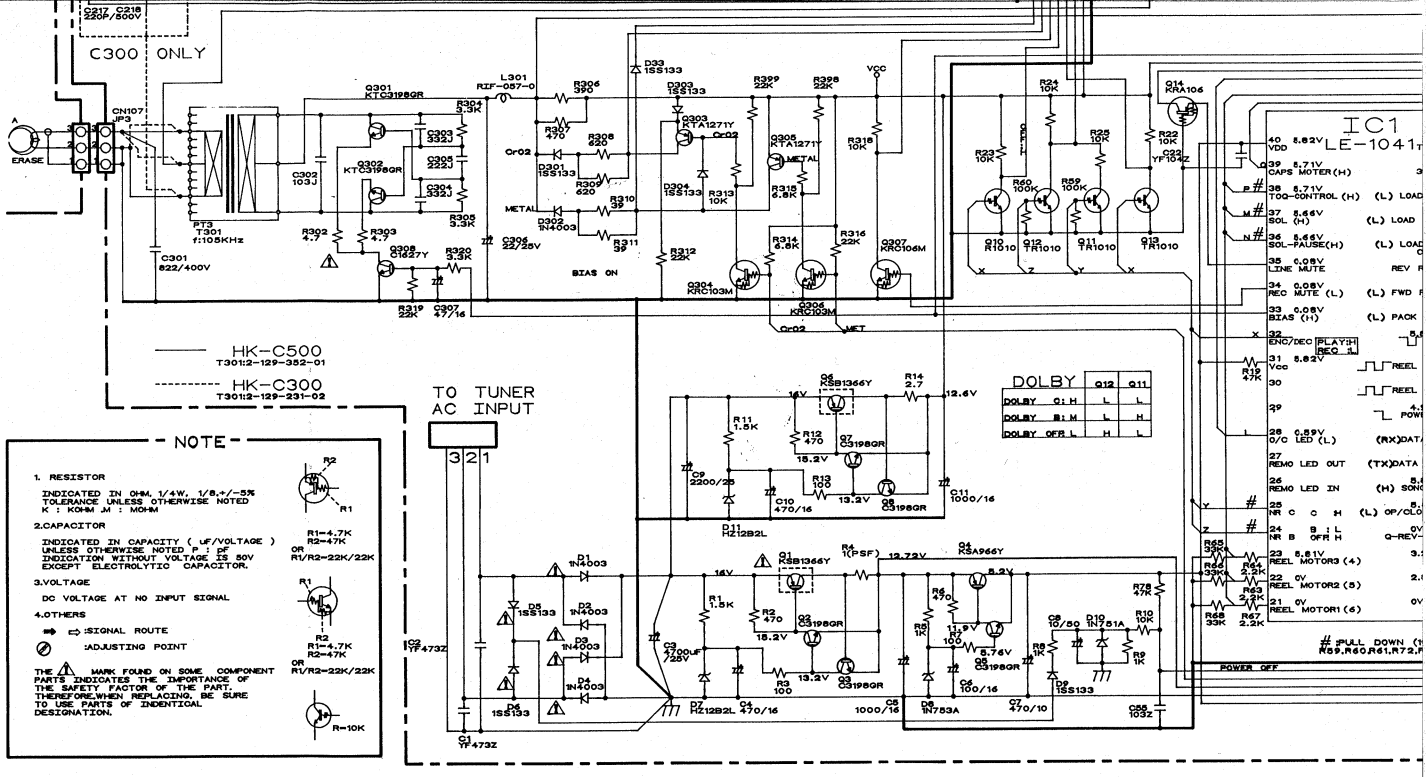

PCB-3 POWER RELAY P.C.B
SYSTEM CONNECTOR
2-170-860-2
FOR UL
J1008
S301
1V-0
VOLTAGE SELECTOR
FU301 T6A/250V
P1
AC 120V, 60Hz
BLACK
WHITE
BROWN (BLACK)
BLUE (WHITE)
AC
RY 301
POWER TRANS
CB353
USA
TI POWER TRANS
2-131-493-01

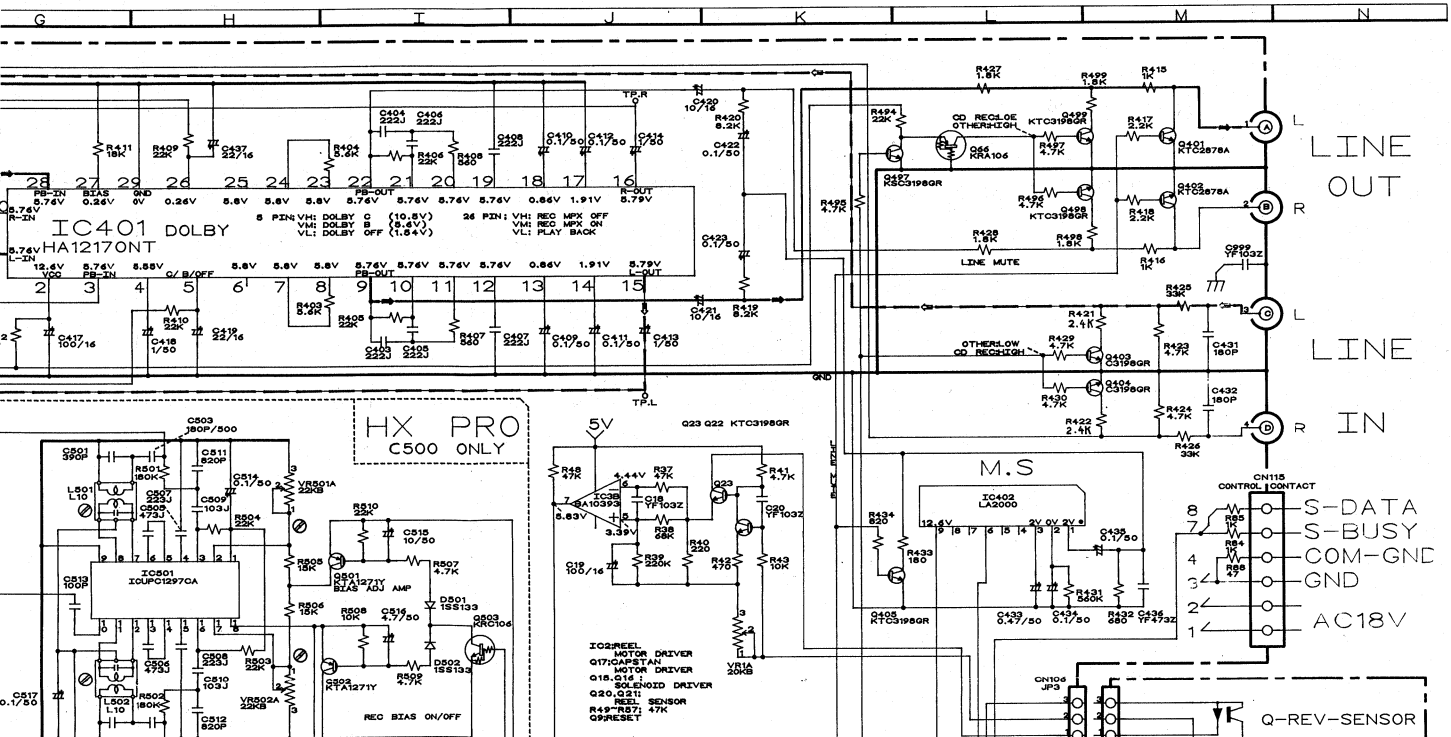

IDLING CURRENT ADJ.(Lch)
IDLING CURRENT ADJ.(Rch)
EARTH WIRE

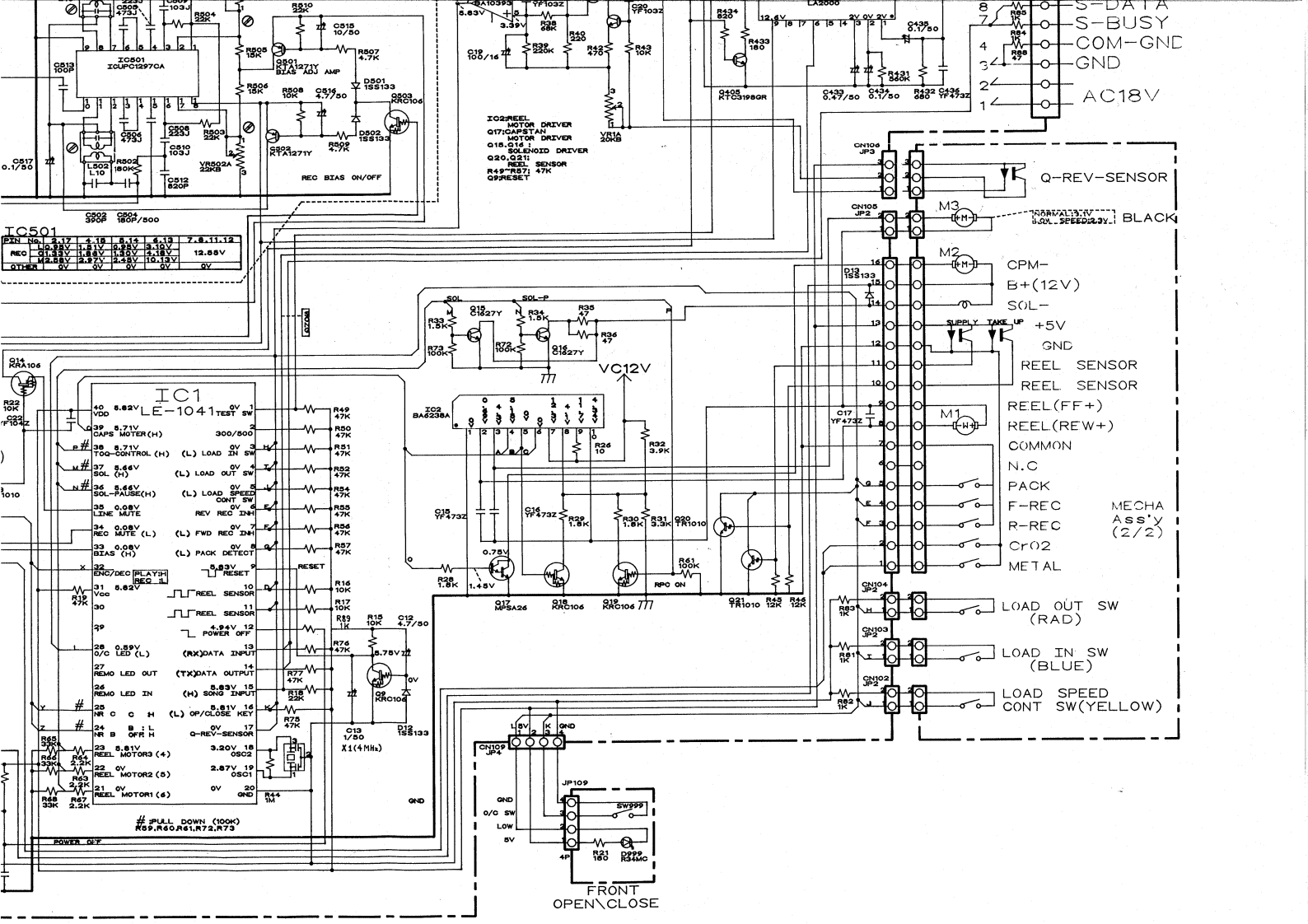

PCB-2 CONTROL P.C.B
CW102
2-170-860-11
BALANCE
PHONES

SCHEMATIC DIAGRAM (C300/C500)

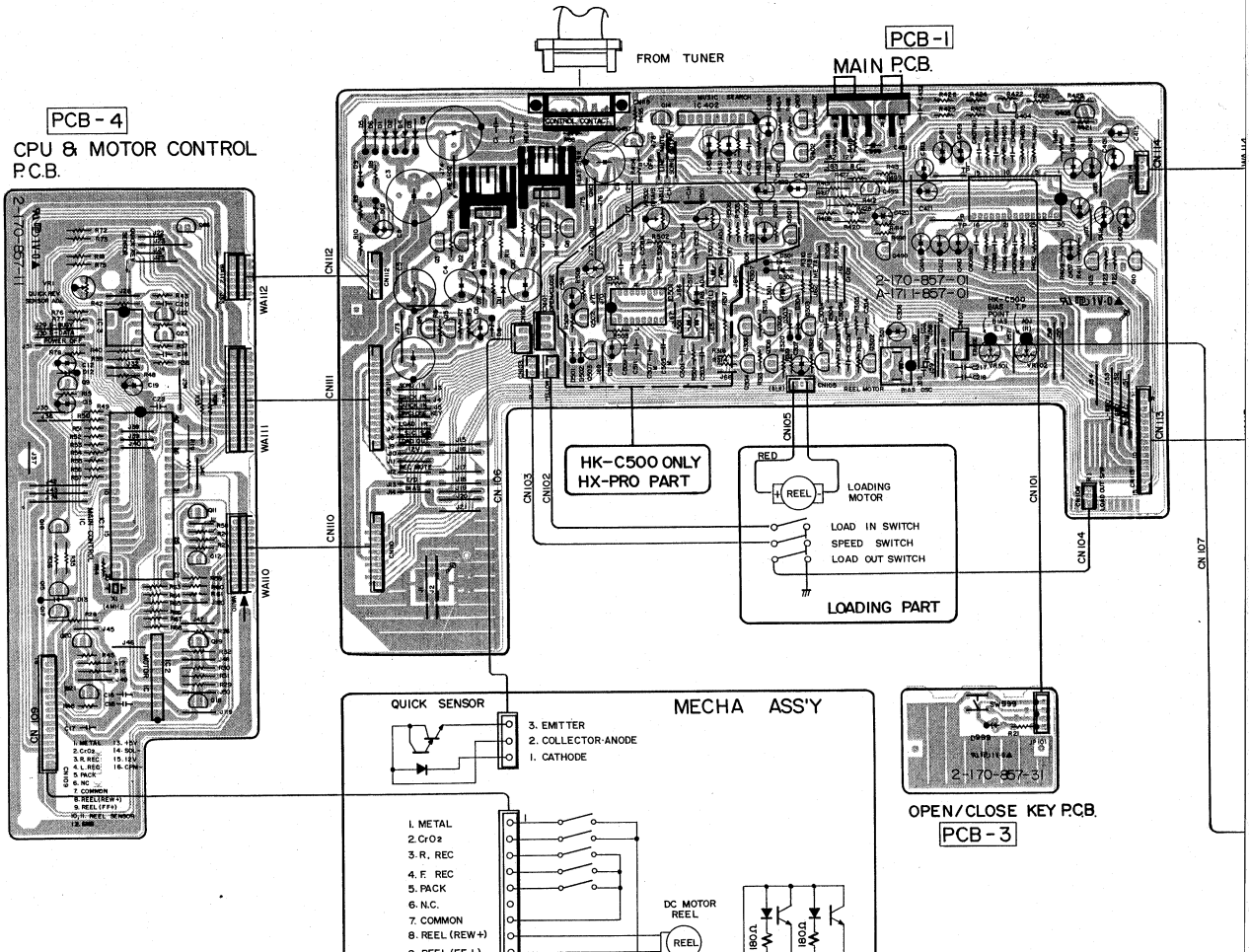


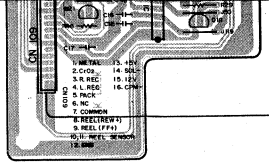

C300 ONLY
HK-C500
T301:2-129-352-01
HK-C300
T301:2-129-231-02
TO TUNER
AC INPUT
NOTE
1. RESISTOR
INDICATED IN OHM, 1/4W, 1/8,+/-5% TOLERANCE UNLESS OTHERWISE NOTED K : KOHM ,M : MOHM
2.CAPACITOR
INDICATED IN CAPACITY (uF/VOLTAGE) UNLESS OTHERWISE NOTED P : pF INDICATION WITHOUT VOLTAGE IS 50V EXCEPT ELECTROLYTIC CAPACITOR.
3.VOLTAGE
DC VOLTAGE AT NO INPUT SIGNAL
4.OTHERS
:SIGNAL ROUTE
:ADJUSTING POINT
THE ⚠ MARK FOUND ON SOME COMPONENT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE PART. THEREFORE,WHEN REPLACING, BE SURE TO USE PARTS OF INDENTICAL DESIGNATION.
R1=4.7K R2=47K OR R1/R2=22K/22K
R=10K
DOLBY
DOLBY C: H L L
DOLBY B: M L H
DOLBY OFF L H L
IC1
LE-1041
POWER OFF

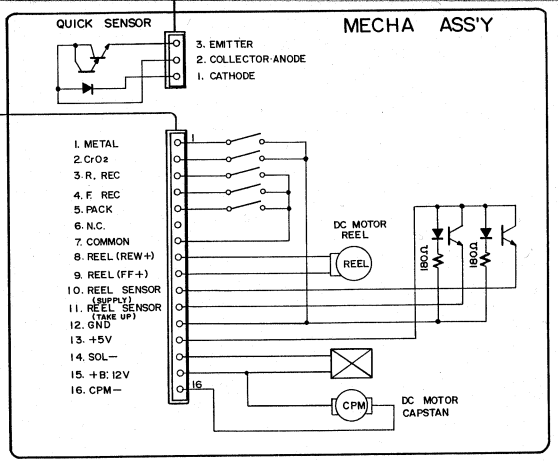

G
H
I
J
K
L
M
N
IC401 DOLBY
HA12170NT
HX PRO
C500 ONLY
IC501
ICUPC1297CA
REC BIAS ON/OFF
IC402
LA2000
M.S
LINE
OUT
LINE
IN
CN115
CONTROL CONTACT
S-DATA
S-BUSY
COM-GND
GND
AC18V
CN106
JP3
Q-REV-SENSOR
LINE MUTE
5V
GND

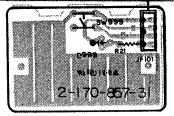

S-DATA
S-BUSY
COM-GND
GND
AC18V
Q-REV-SENSOR
BLACK
CPM-
B+(12V)
SOL-
+5V
GND
REEL SENSOR
REEL SENSOR
REEL(FF+)
REEL(REW+)
COMMON
N.C
PACK
F-REC
R-REC
CrO2
METAL
MECHA Ass'y (2/2)
LOAD OUT SW (RAD)
LOAD IN SW (BLUE)
LOAD SPEED CONT SW(YELLOW)
REC BIAS ON/OFF
IC1
LE-1041
VC12V
FRONT OPEN\CLOSE
POWER OFF

C300/500

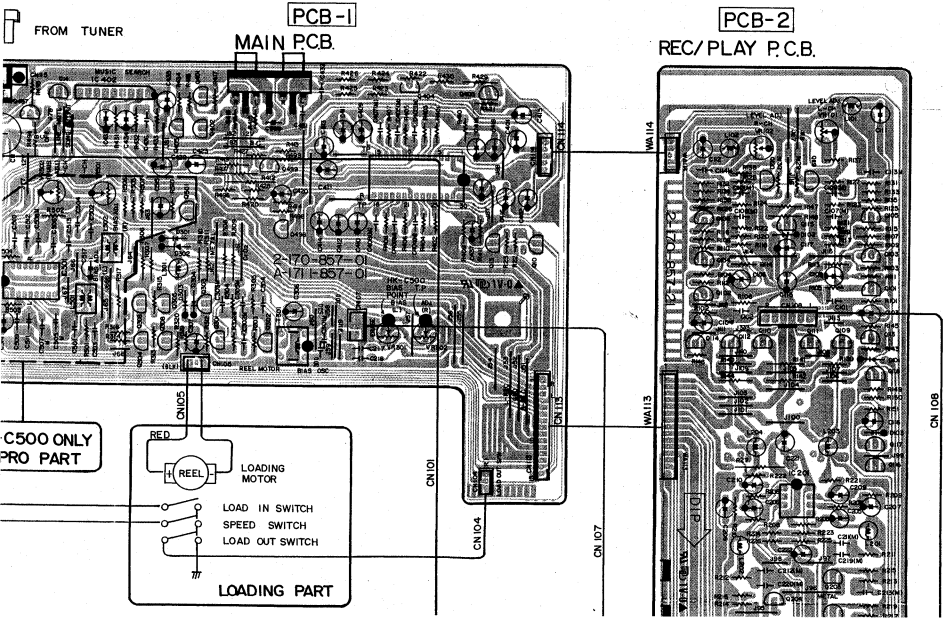

PCB-4
CPU & MOTOR CONTROL P.C.B.
FROM TUNER
PCB-1
MAIN P.C.B.
CONTROL CONTACT
2-170-857-01
A-171-857-01
CN112
CN111
CN110
WA112
WA111
WA110
CN106
CN103
CN102
CN105
CN101
CN104
CN115
CN107
CN109
HK-C500 ONLY
HX-PRO PART
RED
REEL
LOADING MOTOR
LOAD IN SWITCH
SPEED SWITCH
LOAD OUT SWITCH
LOADING PART
QUICK SENSOR
MECHA ASS'Y
3. EMITTER
2. COLLECTOR·ANODE
1. CATHODE
1. METAL
2. CrO2
3. R. REC
4. F. REC
5. PACK
6. N.C.
7. COMMON
8. REEL (REW+)
DC MOTOR REEL
REEL
180Ω
180Ω
2-170-857-31
OPEN/CLOSE KEY P.C.B.
PCB-3

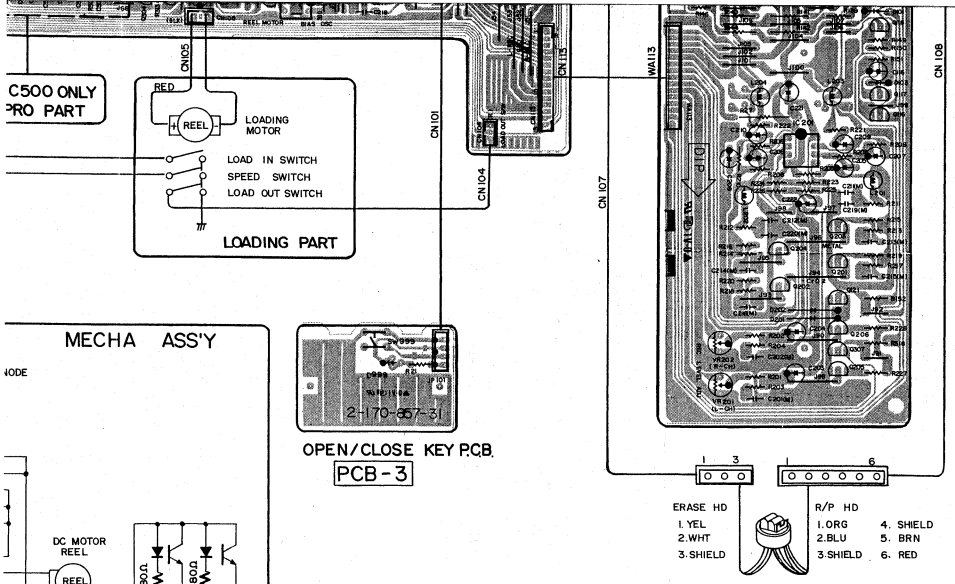




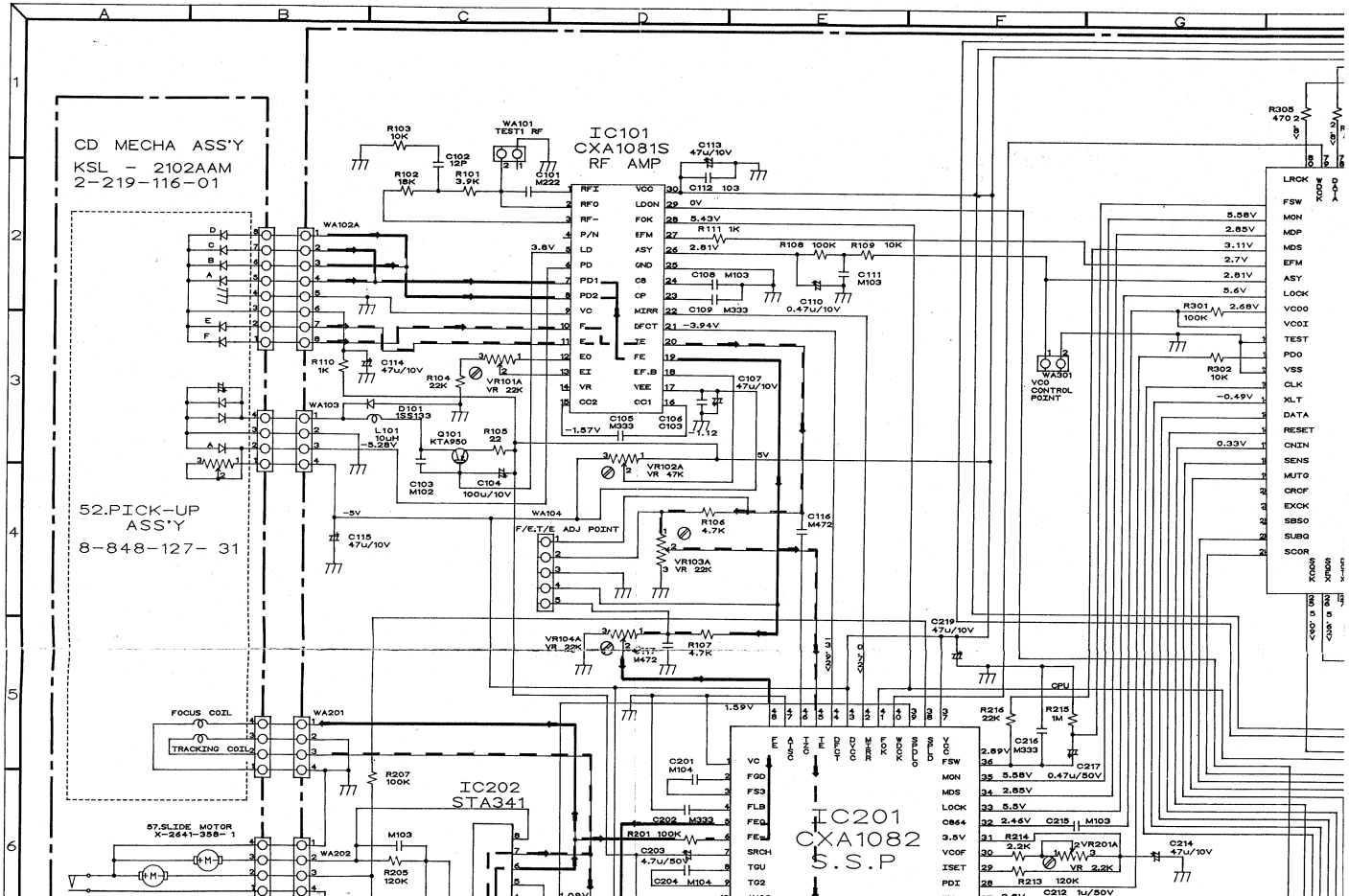


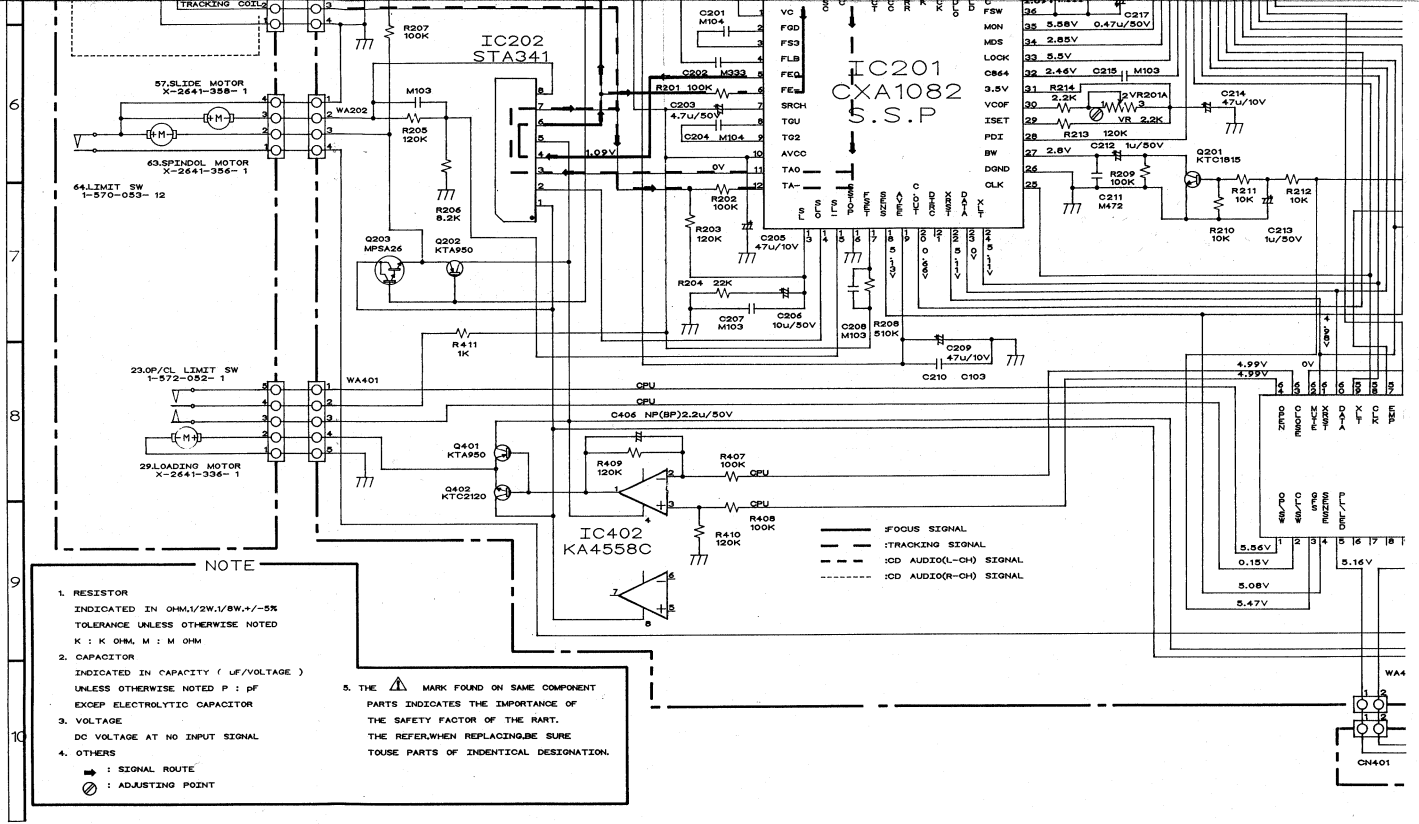
OPEN/CLOSE KEY P.C.B.
PCB-3


FROM TUNER
PCB-1
MAIN P.C.B.
PCB-2
REC/PLAY P.C.B.
2-170-857-01
A-1711-857-01
CN105
CN101
CN104
CN107
CN108
CN114
CN115
WA114
WA113
RED
REEL
LOADING MOTOR
LOAD IN SWITCH
SPEED SWITCH
LOAD OUT SWITCH
LOADING PART
C500 ONLY
PRO PART


C500 ONLY
PRO PART
CN105
RED
REEL
LOADING MOTOR
LOAD IN SWITCH
SPEED SWITCH
LOAD OUT SWITCH
LOADING PART
CN101
CN104
CN115
CN113
CN107
CN108
MECHA ASS'Y
DC MOTOR REEL
180Ω
180Ω
CPM
DC MOTOR CAPSTAN
2-170-857-31
OPEN/CLOSE KEY P.C.B.
PCB-3
ERASE HD
1. YEL
2. WHT
3. SHIELD
R/P HD
1. ORG
2. BLU
3. SHIELD
4. SHIELD
5. BRN
6. RED

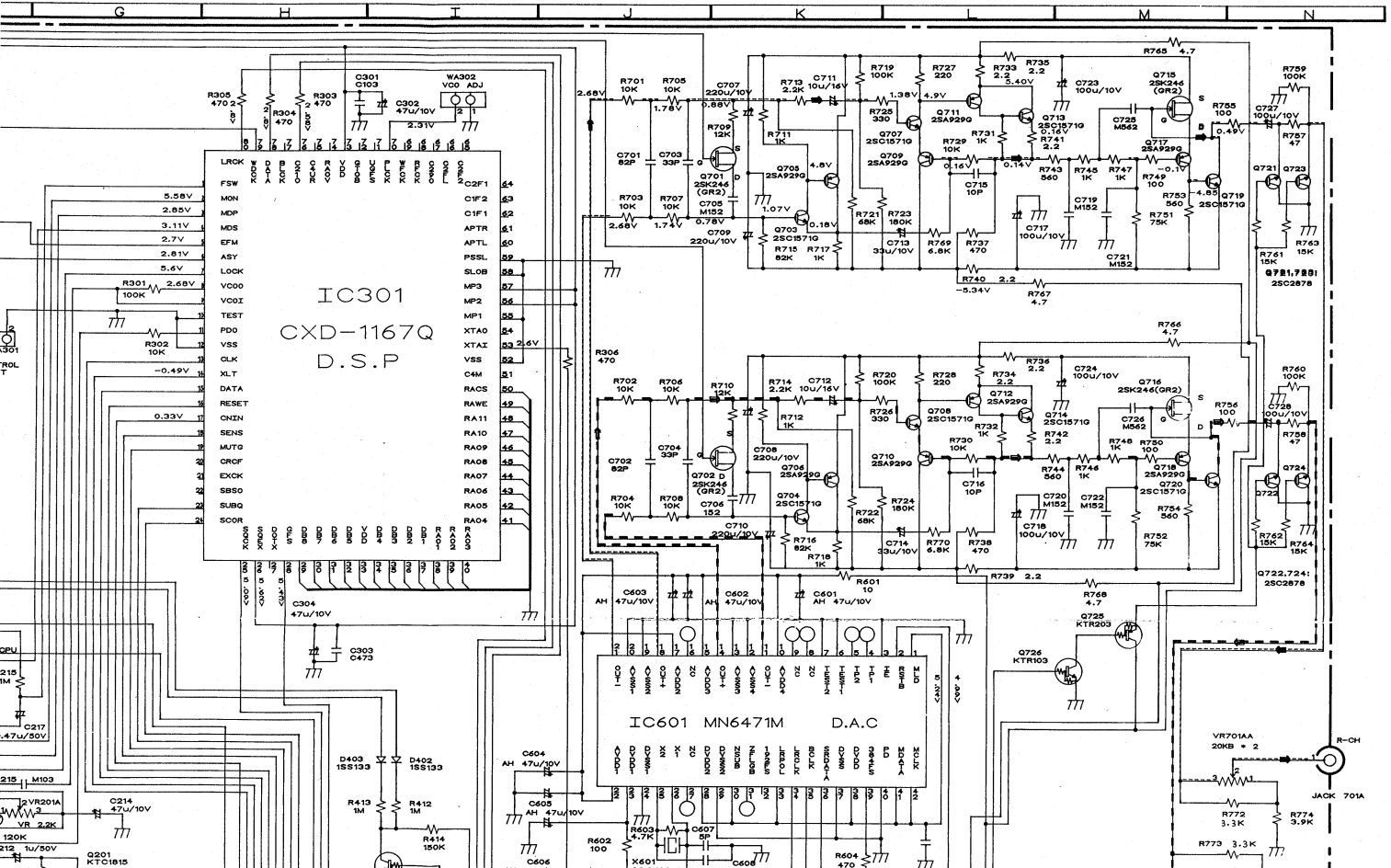
SCHEMATIC DIAGRAM (CD300/CD500)

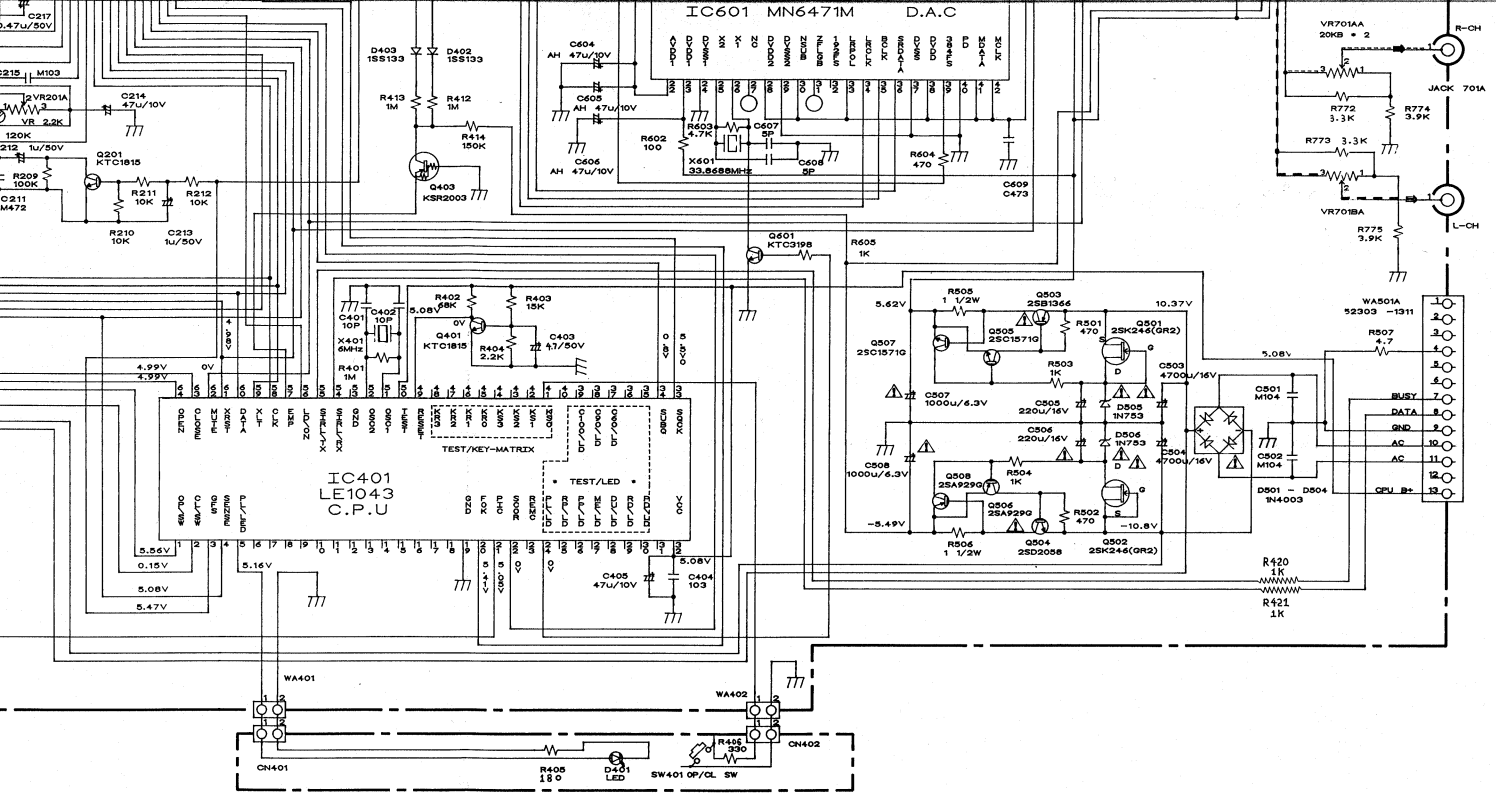




NOTE

1. RESISTOR
   INDICATED IN OHM,1/2W,1/8W,+/-5%
   TOLERANCE UNLESS OTHERWISE NOTED
   K : K OHM, M : M OHM
2. CAPACITOR
   INDICATED IN CAPACITY (uF/VOLTAGE)
   UNLESS OTHERWISE NOTED P : pF
   EXCEP ELECTROLYTIC CAPACITOR
3. VOLTAGE
   DC VOLTAGE AT NO INPUT SIGNAL
4. OTHERS
   ➡ : SIGNAL ROUTE
   ⊘ : ADJUSTING POINT
5. THE ⚠ MARK FOUND ON SAME COMPONENT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE RART. THE REFER,WHEN REPLACING,BE SURE TOUSE PARTS OF INDENTICAL DESIGNATION.

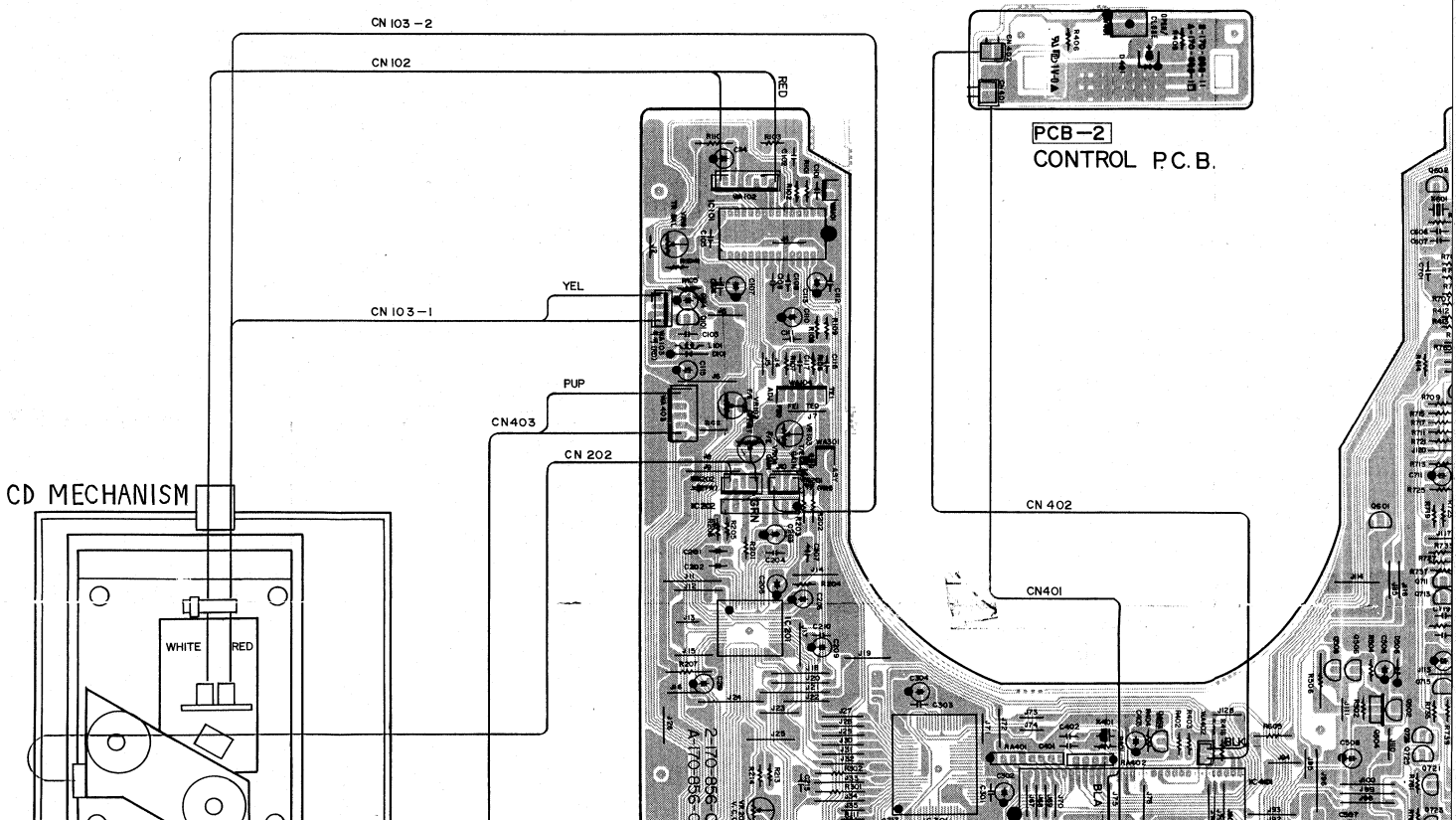

IC301
CXD-1167Q
D.S.P
IC601 MN6471M D.A.C
WA302 VC0 ADJ
R-CH
JACK 701A
2SC2878

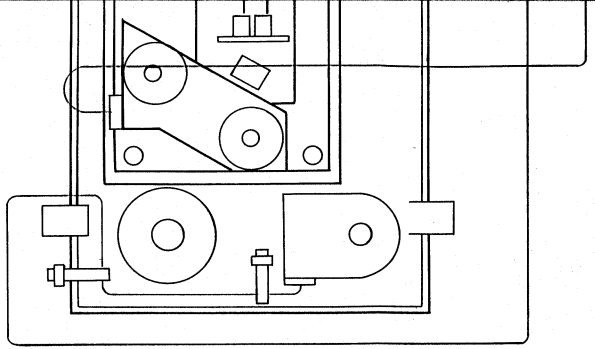

IC601 MN6471M D.A.C
IC401
LE1043
C.P.U
TEST/KEY-MATRIX
TEST/LED
Q601
KTC3198
R605
1K
Q201
KTC1815
Q403
KSR2003
Q401
KTC1815
Q501
2SK246(GR2)
Q502
2SK246(GR2)
Q503
2SB1366
Q504
2SD2058
Q505
2SC1571G
Q506
2SA929G
Q507
2SC1571G
Q508
2SA929G
D505
1N753
D506
1N753
D501 ~ D504
1N4003
X401
6MHz
X601
33.8688MHz
VR201A
VR 2.2K
VR701AA
20KB • 2
VR701BA
JACK 701A
R-CH
L-CH
WA401
WA402
WA501A
52303 -1311
CN401
CN402
SW401 OP/CL SW
D431
LED
R405
180
R406
330
R420
1K
R421
1K
BUSY
DATA
GND
AC
AC
GPU B+

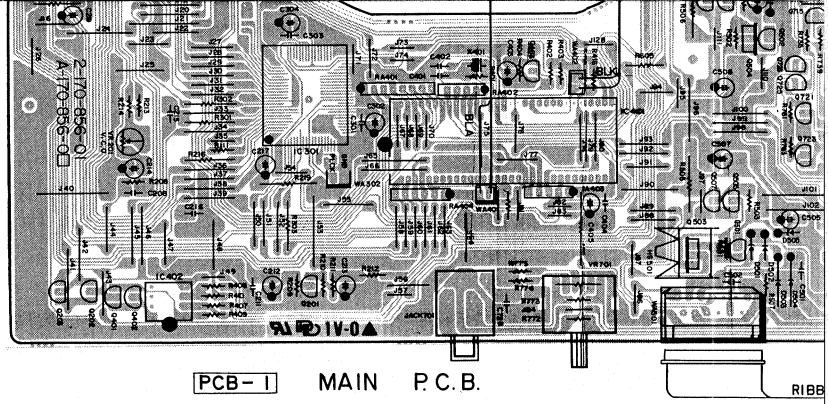
97

WIRING DIAGRAM

CD 300/500







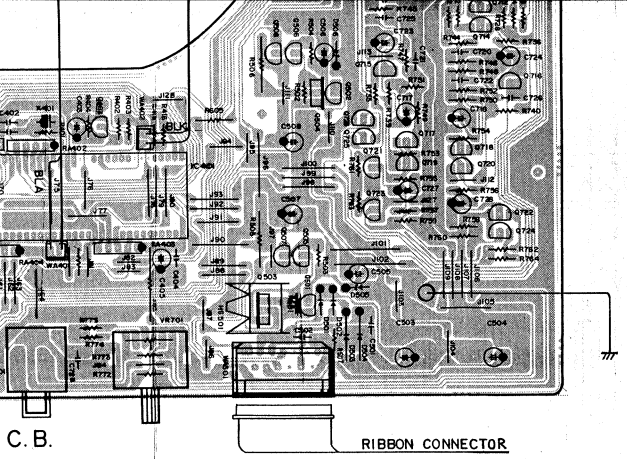
PCB-1 MAIN P.C.B.

WIRE COLOR ABBREVIATIONS

YEL :	YELLOW	PUP :	PURPLE
BLK :	BLACK	RED :	RED
GRN :	GREEN		

B-2

NTROL P.C.B.


C. B.
RIBBON CONNECTOR